

## 4.12 Test Excavation 227 (T-227)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6
<b>TMK #:</b>	2-1-027 [Plat]
<b>Elevation Above Sea Level:</b>	1.54 m
<b>UTM:</b>	617987.9392 m E / 2356057.668 m N
<b>Max Length/Width/Depth:</b>	7.26 m / 0.70 m / 1.35 mbs
<b>Orientation:</b>	54 / 234° TN
<b>Targeted Project Component:</b>	Utility Relocation
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 227 (T-227) was located in the right lane of Punchbowl Street, near its intersection with Pohukaina Street. T-227 was adjacent to the berm of the roadway, approximately 63 cm from the sidewalk curb. A waterline was located 1.1 m to the east, in a parallel direction with the excavation area. T-227 was located on property owned by the City and County of Honolulu. The excavation area was level with the surrounding land surface.

**Summary of Background Research and Land Use: Research and Land Use:** Land Court Application 345 Map 1 indicated that T-227 was originally situated on land awarded to V. Kamāmalu as part of LCA 7712. S. E. Bishop's map of the Kewalo area of Honolulu (1884) indicated that T-227 was located approximately 30 m southeast of the former shoreline within an unnamed road leading to the Immigrant Depot (on present-day Ala Moana Boulevard). In a map of Honolulu by W. A. Wall (1887), the unnamed road is named Kaka'ako Street and the area of the former shoreline has become reclaimed land with proposed development, moving the shoreline to below present-day Ala Moana Boulevard. According to M. D. Monsarrat's 1897 map of Honolulu, the location of T-227 was still an undeveloped area and along a small street intersecting with Punchbowl Street. In Newton's 1904 map of Honolulu the small street has become an extension of Punchbowl Street and the location of T-227 was next to Honolulu Iron Works. The 1919 U.S. Army War Department map of Honolulu indicated the location of T-227 as within Punchbowl Street.

Previous archaeology of the surrounding area includes two primary studies. In 1985, excavations conducted at the former location of the Honolulu Iron Works encountered five human burials in a parcel of land between Punchbowl Street and South Street and from Pohukaina Street to near Ala Moana Boulevard (Yent 1985). The Department of Land and Natural Resources conducted the fieldwork and identified the burials in a sand deposit within burial pits located beneath approximately 1 m of fill. The exact location of the five burials within the study area was not recorded, although the report notes the construction site as being at the intersection of Punchbowl Street and Pohukaina Street. The northwestern border of the study area at this intersection is less than 25 m southeast of T-227. All five burials were assigned SIHP #50-80-14-2918 and were disinterred.

Between 1986 and 1988, CSH conducted archaeological monitoring within the Hawai'i Community Development Authority's Kaka'ako Improvement District 1 (ID-1), which included Punchbowl Street and the location of T-227 (Pfeffer et al. 1993). A total of 149 burials were documented and disinterred during archaeological monitoring within Kaka'ako Improvement District 1 from four specific burial areas consisting of two cemeteries and two isolated burials: Queen Street (116 burials assigned SIHP #50-80-14-4534); South Street (31 burials assigned SIHP #50-80-14-3712); Halekauwila Street (1 burial assigned SIHP #50-80-14-4532); and Punchbowl Street (1 burial assigned SIHP #50-80-14-4533). The one burial that was identified on Punchbowl Street was located at the King Street intersection, approximately 510 m northeast of T-227.

**Documentation Limitations:** T-227 was excavated to a maximum depth of 1.35 mbs in natural sediment at the coral shelf and beneath the water table, which was present at 1.26 mbs. There were no factors that limited documentation of T-227. A backhoe was used to remove the upper fill strata and expose the underlying natural sediment. All of the natural sediment within T-227 was hand-excavated to the coral shelf.

A total of seven features were identified and designated Features 14–21 (see Features Discussion below). Each feature was bisected and the sediment was screened and any artifacts collected. The remaining halves of the features were excavated similarly and bulk samples were collected for further sample processing, with the exclusion of Feature 6, which was mostly in the sidewall and had little content within the excavation area.

**Stratigraphic Summary:** The stratigraphy of T-227 consisted of fill overlying the former land surface and natural sediment to the coral shelf. Observed strata included asphalt (Ia), gravel base course (Ib), silty loam fill (Ic), and extremely gravelly and cobbly sandy loam fill (Id), overlying a silty sand buried cultural A-horizon (II), natural Jaucas sand (III), and natural gleyed silty sand (IV). The buried A-horizon (II) of T-227 was considered to be a subsurface cultural deposit and designated as a component of SIHP #50-80-14-2918. The stratigraphy of T-227 did not conform to the USDA soil survey designation of Fill land.

**Artifacts Discussion:** A total of 108 historic artifacts (Acc. #227-A-1 to A-29), see following table and photographs) was recovered from T-227, 53 ceramic fragments from a minimum of 8 vessels, 15 glass fragments from six bottles, and 40 miscellaneous items. Historic artifacts were collected from the imported fill (Stratum Ic) and within the buried A-horizon (Stratum II/SIHP #50-80-14-2918). Stratum Ic contained a dark glass fragment (made pre-1920) and a ceramic fragment. Artifacts collected from Stratum II included assorted ceramic fragments, 10 bottle glass fragments from three bottles, a shank button, a celluloid comb fragment, a marble, and seven red brick fragments,. The bottle glass fragments dated between the 1870s to the 1920s. The ceramics were a mixture of Anglo/American and Asian wares. Historic artifacts were also encountered within additional features extending from the buried A-horizon (Stratum II) into the natural Jaucas sand (Stratum III) (see Features Discussion below). Feature 14 contained a bottle glass fragment. A bulk sediment sample from Feature 16 contained unidentified rusted metal and bottle glass. Feature 17 contained an oblong, tapered ivory bead, a pressed glass item, possibly a candle-holder, and corroded metal. The bulk sample from Feature 21 contained 0.3 g of historic ceramic fragments.

**Features Discussion:** A total of seven features (Feature 14-21) were identified at the interface of Stratum II (A-horizon) and Stratum III (Jaucas sand). Features 14-21 were documented within T-227 as extensions of the buried A-horizon (Stratum II) into underlying natural Jaucas sand (Stratum III). The buried A-horizon (II) was designated as a component of SIHP #50-80-14-2918, which was also identified within T-226A, T-226B, T-226C, T-226D, and T-227A. The seven features within T-227 were designated as Features 14-21 of SIHP# 50-80-14-2918.

SIHP #50-80-14-2918 Feature 14 had an irregular-shaped outline from 0.90–1.07 mbs in the northern end of T-227. A substantial sub-feature, SIHP# 50-80-14-2918 Feature 15, was encountered after bisecting Feature 14. The sub-feature was circular with a diameter of approximately 22 cmbs and a depth from 0.93–1.13 mbs. A bulk sample from Feature 14 yielded small amounts of charcoal (3.5 g), shell (1.7 g); a historic bottle glass fragment (0.7 g), and fragments of fish bones (0.1 g). The shell material was classified as Mytilidae (*Brachidontes crebristriatus*) (1.1 g) and gastropods/miscellaneous (0.6 g). The fish bone fragments were not identifiable to the species level. A butchered rib fragment from a cow (*Bos taurus*) was encountered during the excavation of Feature 14. Feature 15 was likely a postmold and Feature 14 is a potential pit of indeterminate function, possibly relating to the filling of the postmold.

SIHP #50-80-14-2918 Feature 16 had a roughly circular outline near the northern end of the T-227 and was approximately 65 cm long extending 40 cm into the plan view of the excavation from the northwest sidewall from 1.01–1.17 mbs. The sediment content within the feature was very cobbly and contained many rootlets and organic material at the base. A bulk sample from Feature 16 yielded small amounts of charcoal (0.3 g), unidentified shell fragments (0.8 g), rusted metal (0.9 g), and a very small fragment of bottle glass (0.2 g). An unidentified faunal long bone shaft was encountered during the excavation of Feature 16, likely originating from a medium-sized mammal. Feature 16 is interpreted as a pit of indeterminate function.

SIHP #50-80-14-2918 Feature 17 had a roughly ovoid outline near the central portion of the T-227 from 1.05–1.16 mbs. It extended approximately 70 cm into the excavation from the southeast sidewall and was approximately 35 cm wide. The upper portion of Feature 17 contained an oblong and tapered ivory bead, an unknown rusted metal piece and two pig (*Sus scrofa*) molars which were found over a glass candle-holder, cobbles, and rootlets at the bottom of the feature. A bulk sediment sample was collected and yielded small amounts of charcoal (0.4 g), shell (3.6 g), rusted metal (4.8 g), aqua bottle glass (2.6 g), medium mammal osseous remains (0.5 g), and fish remains (0.1 g). The shell material was identified as Carditidae (*Cardita thaanumi*) (0.2 g), Neritidae (*Nerita picea*) (0.1 g), Tellinidae (*Tellina palatam*) (1.7 g), Mytilidae (*Brachidontes crebristriatus*) (1.2 g), Echinodermata *diadema sp./mathaei sp.* (0.3 g), and Tellinidae (*Tellina sp.*) (0.1 g). Feature 17 is interpreted as a pit of indeterminate function.

SIHP #50-80-14-2918 Feature 18 had an ovoid outline near the central portion of the T-227 from 1.00–1.05 mbs. It extended approximately 25 cm into the excavation from the northwest sidewall and was approximately 25 cm wide. A bulk sample from Feature 18 yielded a small amount of charcoal (0.1 g), shell (0.5 g), and fish remains (0.1 g). The shell material was identified as shell fragments/limpets (0.4 g) and Echinodermata *diadema sp.* (0.1 g). Feature 18 is interpreted as a potential pit of indeterminate function.

SIHP #50-80-14-2918 Feature 19 was mostly circular with a diameter of 15 cm in the southern end of T-227 from 1.00–1.22 mbs. A bulk sample from Feature 19 yielded a small amount of

charcoal (1.0 g) and shell (3.14 g). The shell material was classified as Hipponicidae (*Hipponix spp.*) (0.2 g), Turbinidae (*Turbo sandwicensis*) (1.74 g), Echinodermata *mathaei sp.* (0.7 g), and Planaxidae (*Planaxis ponderosa*) (0.5 g). Feature 19 is interpreted as a pit of indeterminate function.

SIHP #50-80-14-2918 Feature 20 was mostly circular extending into the excavation 12 cm from the northwest sidewall in the southern end of T-227 from 0.98–1.02 mbs. The potential feature was bisected and the sediment was screened. No bulk sample was collected due to the small size and no cultural material was observed during the excavation of Feature 20. Feature 20 is interpreted as a potential pit of indeterminate function.

SIHP #50-80-14-2918 Feature 21 was irregularly shaped in the southern end of T-227 from 1.00–1.19 mbs. A bulk sample from Feature 21 yielded a small amount of charcoal (0.9 g), shell (3.1 g), and an historic ceramic (0.3 g). The shell material was classified as limpets/gastropods (0.5 g), Tellinidae (*Tellina palatam*) (1.3 g), Mytilidae (*Brachidontes crebristriatus*) (0.5 g), Turbinidae (*Turbo sandwicensis*) (0.4 g), crustacean (0.2 g), and Echinodermata *diadema sp./mathaei sp.* (0.2 g). Feature 21 is interpreted as a potential pit of indeterminate function.

**Terrestrial Faunal Remains Collected During Excavation:** Faunal remains were collected individually during excavation from Stratum II: a general collection from 0.49 to 1.12 mbs, as well as feature specific collections at features 14 (0.9-1.07 mbs), 16 (1-1.07 mbs), and 17 (1.05-1.16 mbs) of SIHP# 50-80-14-02918. The general collection from Stratum II contained *Bos taurus* and *Sus scrofa* skeletal elements, the majority of which had been butchered with a metal saw blade, indicating an historic origin, not traditional Hawaiian. Feature 14 contained a single *Bos taurus* rib that had been butchered with a metal saw blade, indicating an historic origin, not traditional Hawaiian. Feature 16 contained unmodified medium mammal diaphysis fragments, and Feature 17 contained unmodified *Sus scrofa* molar fragments (that mend). *Sus scrofa* is a Polynesian introduction common in both pre- and post-Contact contexts.

**Sample Results:** A total of six bulk sediment samples were collected from the buried A-horizon (Stratum II) and associated features (Feature 14, 16–19, 21) within T-226B. All of the sediment samples were wet-screened.

A two-liter bulk sediment sample was collected from Stratum II (Feature 14) between 0.90 mbs and 1.07 mbs. The sample contained charcoal (3.5 g), naturally deposited shell Mytilidae *Brachidontes crebristriatus* (1.1 g), gastropods (0.6 g), bottle glass (0.7 g), and fish remains (0.1 g).

A two-liter bulk sediment sample was collected from Stratum II (Feature 16) between 1.00 mbs and 1.17 mbs. The sample contained charcoal (0.3 g), naturally deposited shell (0.8 g), rusted metal (0.9 g), and bottle glass fragments (0.2 g).

A two-liter bulk sediment sample was collected from Stratum II (Feature 17) between 1.05 mbs and 1.16 mbs. The sample contained charcoal (0.4 g), naturally deposited Carditidae *Cardita thaanumi* (0.2 g), Neritidae *Nerita picea* (0.1 g), rusted metal (4.8 g), aqua colored bottle glass (2.6 g), medium mammal remains (0.5 g), fish remains (0.1 g), and midden (3.3 g).

A one-liter bulk sediment sample was collected from Stratum II (Feature 18) between 1.00 mbs and 1.05 mbs. The sample contained charcoal (0.1 g), naturally deposited shell fragments (0.4 g), Echinodermata *diadema sp.* (0.1 g), and fish remains (0.1 g).



A two-liter bulk sediment sample was collected from Stratum II (Feature 19) between 1.00 mbs and 1.22 mbs. The sample contained charcoal (1.0 g), naturally deposited Hipponicidae *Hipponix* spp. (0.2 g), and midden (2.84 g). Midden collected included Turbinidae *Turbo sandwicensis* (1.74 g), Echinodermata *mathaei* sp. (0.7 g), and Planaxidae *Planaxis ponderosa* (0.5 g).

A two-liter bulk sediment sample was collected from Stratum II (Feature 21) between 1.00 mbs and 1.19 mbs. The sample contained charcoal (0.8 g), naturally deposited limpets and gastropods (0.5 g), ceramic fragments (0.3 g), and midden (2.6 g). Midden collected included Tellinidae *Tellina palatum* (1.3 g), Mytilidae *Brachidontes crebristriatus* (0.5 g), Turbinidae *Turbo sandwicensis* (0.4 g), crustacean fragments (0.2 g), and Echinodermata *diadema* sp. and *mathaei* sp. (0.2 g).

The results of sample analysis indicate that the presence of charcoal, midden, naturally deposited shell (non-midden), historic artifacts, and faunal remains were found in T-227.

**GPR Discussion:** A review of amplitude slice maps indicated no linear features that might indicated the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.5 mbs.

GPR depth profiles for T-227 identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.25 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-227 was excavated to a maximum depth of 1.35 mbs in natural sediment at the coral shelf and beneath the water table, which was present at 1.26 mbs. The stratigraphy of T-227 consisted of fill strata (Ia–Id) overlying the former land surface (II) and natural sediment (III–IV) to the coral shelf. The stratigraphy of T-227 did not conform to the USDA soil survey designation of Fill land. The buried A-horizon (Stratum II) was considered to be a component of SIHP #50-80-14-2918, a subsurface cultural deposit encompassing the area. A total of seven features (14–21) were identified extending from the base of the culturally-enriched A-horizon and into the natural Jaucas sand (III). Feature 15 appeared to be a post-mold, while Features 14 and 16–21 were of indeterminate function. Overall, material collected from Features 14–21 and from the buried A-horizon (II) consisted of charcoal, various shell, unidentified fish remains, historic artifacts (including an ivory bead, glass fragments, ceramic sherds, rusted metal pieces, and a glass candle holder) and butchered faunal remains from a cow (*Bos taurus*) and pig (*Sus scrofa*). The faunal material encountered likely represents food remains. The presence of the seven features extending from Stratum II down into Stratum III indicated the former land surface was a human activity area. The seven features within T-227 were designated as Features 14–21 of SIHP #50-80-14-2918. The buried A-horizon (SIHP #50-80-14-2918) was also identified within T-226A, T-226B, T-226C, T-226D, and T-227A and is further described in Volume I.



T-227 at the start of excavation, view to east



T-227 southeast wall profile, view to southeast





Bisected Feature 15 at north end of T-227, view to northeast



Bisected Feature 16 near north end of T-227, view to southwest





Close-up of bisected Feature 17 in central portion of T-227, showing rusted metal, glass candle holder, and cobbles, view to northeast





Bisected Feature 18 in center portion of northwest sidewall of T-227, view to west



Bisected Feature 19 near southern end of T-227, view to southeast





Bisected Feature 20 near southern end of T-227, view to west

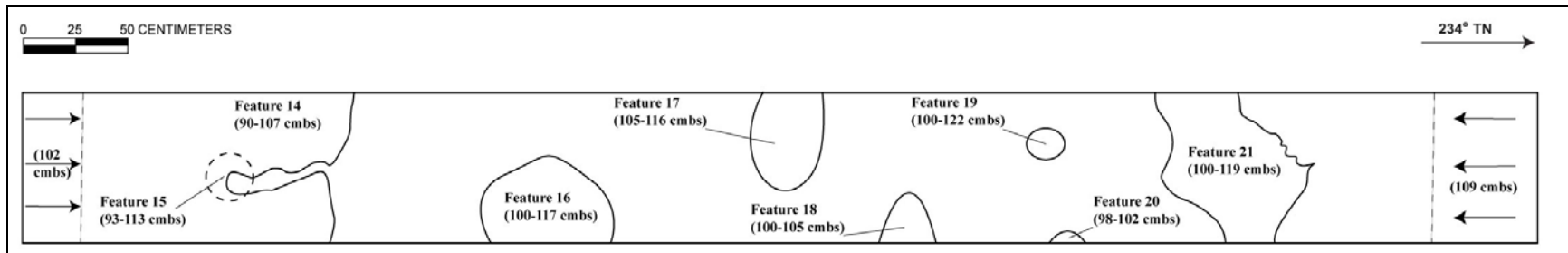


Bisected Feature 21 in southern end of T-227, view to southwest

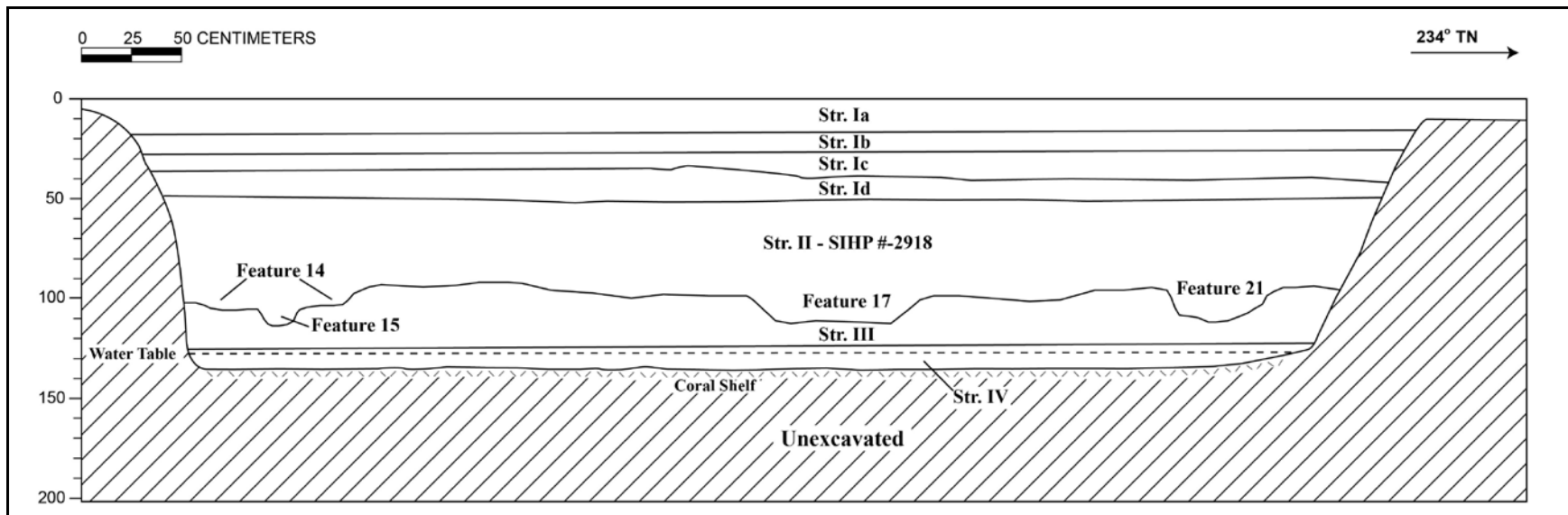




T-227 plan view at Stratum II/Stratum III interface, view to northeast



T-227 plan view of the Stratum II/Stratum III interface showing SIHP# 2918 Features 14-21



T-227 southeast wall profile showing SIHP# 2918 Feature 14, 15, 17, and 21



## T-227 Stratigraphic Description

Stratum	Depth (cmts)	Description
Ia	0–17	Asphalt; road surface
Ib	16–27	Fill; 10 YR 5/1 (gray); extremely gravelly sand; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; crushed basalt gravel base course fill
Ic	26–41	Fill; 10 YR 5/4 (yellowish brown); silty loam; weak, fine crumb structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; imported fill; contained glass fragment and ceramic sherd
Id	41–52	Fill; 10 YR 5/8 (yellowish brown); extremely gravelly and cobbly sandy loam; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; imported fill
II	49–112	Natural, A-horizon; 10 YR 5/2 (grayish brown); silty sand; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; abrupt, wavy lower boundary; few, medium to coarse roots; contained red brick, glass fragments, ceramic sherds, ceramic button, bone or petrified wood bead; buried former land surface
III	90–126	Natural; 10 YR 7/4 (pale brown); sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; diffuse, smooth lower boundary; Jaucas sand
IV	126–135	Natural; GLEY 1 4/N (dark gray); silty sand; structureless, single-grain; wet, non-sticky consistency; non-plastic; marine origin; lower boundary not visible

## T-227 Historic Artifact Analysis

Acc. #227-A-	Provenience	Ceramic Vessel Type	Portion	No.	Paste; Decor.	Age; Origin	Comments
1	T-227, St. II	Dinnerware	Body	30	Earthenware, Refined		From one large vessels, possibly with a handle
2	T-227, St. II	Bottle	Body	8	Stoneware		
3	T-227, St. II	Crock?	Body	8	Stoneware		Yellow
4	T-227, St. II	Crock?	Body	1	Stoneware		Yellow on both sides
5	T-227, St. II	Dinnerware	Rim	1	Porcelain; Painted underglaze		Sherd interior has blue floral garland around rim and exterior has blue floral garland, above it is a blue banded, braided pattern consisting of circles and ovals
6	T-227, St. II	Dinnerware	Body	1	Porcelain; Painted underglaze		Three circles (visible)
7	T-227, St. II	Dinnerware	Body	1	Porcelain; Sponge, painted underglaze		Blue and pink floral pattern, sponged and painted
8	T-227, St. II	Dinnerware	Body and rim	3	Porcelain		
Acc. #227-A-	Provenience	Glass Bottle Type	Portion	No.	Color	Age; Origin	Comments
9	T-227, St. Ic	Bottle	Base	1	Olive	pre-1920	Push-up
10	T-227, St. II	Bottle, Milk	Body	3	Clear	1870s-post	"HA" / "PROPERT[Y]" / "K. YAMASH" / "PHO" embossed horizontally on body; other two shards have no embossing
11	T-227, St. II	Bottle	Body	1	Olive		3 embossed letters on fragment, two are cut off and one is a "T" (NET?)
12	T-227, St. II	Bottle, Spirits	Body (4); base (1)	5	Olive	1870s-1920s	"N" embossed on base; push-up
13 14	T-227, St. II, Fea.	Bottle	Body	1	Olive		

Acc. #227- A-	Provenience	Glass Bottle Type	Portion	No.	Color	Age; Origin	Comments
14	T-227, St. II, Fea. 16	Bottle	Body	4	Brown, Light		
Acc. #227- A-	Provenience	Miscellaneous Type	Portion	No.	Material	Age; Origin	Description
15	T-227, St. II	Spike?	Fragment	2	Metal		Very corroded
16	T-227, St. II	Spike, Rail	Complete	1	Metal		Bi-tapered, broken head
17	T-227, St. II	Water/Utility Pipe?	Fragment	1	Metal		Very corroded
18	T-227, St. II	Roofing tile?	Fragment	1	Stone		
19	T-227, St. II	Tile	Body	1	Ceramic		White glazed Tile
20	T-227, St. II	Marble	Fragment	2	Glass		Opaque and clear
21	T-227, St. II	Button	Complete	1	Glass		No holes, wire shank
22	T-227, St. II	Comb	Fragment	1	Rubber		Long tines, poss. a hair ornament rather than a true comb
23	T-227, St. II	Asphalt/Brick	Fragment	20	Composite		Small fragments
24	T-227, St. II	Brick	Fragment	1			Red color, machine- made
25	T-227, St. II	Brick	Fragment	1			Red color, possible mold mark, raised lip
26	T-227, St. II	Brick	Fragment	5			Red color
27	T-227, St. II, Fea. 14	Nail	Fragment	1	Metal		Too corroded to see cross-section shape
28	T-227, St. II, Fea. 17	Candle Stick Holder	Complete	1	Glass		Floral pattern
29	T-227, St. II, Fea. 17	Bead	Complete	1	Ivory		Ivory bead, possibly from a necklace



T-227 ceramic fragments from one vessel (Acc. #227-A-1) from Stratum II



T-227 representative ceramic fragments (Acc. #227-A-2 to A-3) from one tan and one yellow stoneware bottle in Stratum II



T-227 ceramic fragments (Acc. #227-A-4 to A-8) exterior, from Stratum II



T-227 ceramic fragments (Acc. #227-A-4 to A-8) interior, from Stratum II





T-227 glass bottle fragments (Acc. #227-A-10 to A-12) from Stratum II



T-227 miscellaneous artifacts (Acc. #227 A-15 to A-22) from Stratum II



T-227 pressed glass artifact (Acc. #227 A-28) from Feature 17



T-227 machine-drilled ivory bead (Acc. #227-A-29) from Feature 17

T-227 Faunal Analysis Table

Acc. #	Stratum	Depth(cmbs)	Feature	Family/Class	Species	Element	Description	Modification
227-F-1	II	49–112	-	Bovidae (cow)	<i>Bos taurus</i>	Scapula; Vertebra spinous process; Vertebrae; Humeral condyle (distal portion); Tibia diaphysis section; Tibia (distal portion); Distal femoral condyle (anterior portion); Distal femoral condyle (posterior portion)	Fragments	Scapula; Vertebrae; Humeral condyle (distal portion); Tibia diaphysis section; Distal femoral condyle (anterior portion); Distal femoral condyle (posterior portion) butchered (cut with metal blade)
227-F-2	II	49–112	-	Suidae (pig)	<i>Sus scrofa</i>	Cranial; Scapula; Mandible with molars and premolars; Mandible with molars and premolars; Tusk; Innominate fragment (pieces mend)	Fragments	Cranial; Scapula butchered (cut with metal blade)
227-F-3	II	90–107	14	Bovidae (cow)	<i>Bos taurus</i>	Rib	Fragment	Rib butchered (cut with metal blade)
227-F-4	II	100–107	16	Mammalia	Medium mammal	Diaphysis section	Fragment	None
227-F-5	II	105–116	17	Suidae (pig)	<i>Sus scrofa</i>	Molars (pieces mend)	Fragment	None



### 4.13 Test Excavation 227A (T-227A)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6
<b>TMK #:</b>	2-1-027 [Plat]
<b>Elevation Above Sea Level:</b>	1.55 m
<b>UTM:</b>	617986.6598 mE 2356052.388 mN
<b>Max Length/Width/Depth:</b>	7.33 m / 0.75 m / 1.4 mbs
<b>Orientation:</b>	46 / 226° TN
<b>Targeted Project Component:</b>	Utility Relocation
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 227A (T-227A) was located in the right center lane of Punchbowl Street, near its intersection with Pohukaina Street. T-227A was within 4 m of Test Excavation 227 (T-227). T-227A was added for further testing of the utility relocation due to the presence of cultural material and sand in T-227. Two waterlines were parallel to T-227A, one waterline was located 1.1 m to the northwest and another was 1.0 m to the southeast. T-227A was located on property owned by the City and County of Honolulu. T-227A was added to further investigate subsurface cultural deposits designated SIHP # 50-80-14-2918. This test excavation also investigated a utility relocation. The excavation area was level with the surrounding land surface.

**Summary of Background Research and Land Use:** Land Court Application 345 Map 1 indicated that T-227A was originally situated on land awarded to V. Kamāmalu as part of LCA 7712. S. E. Bishop's map of the Kewalo area of Honolulu (1884) indicated that T-227A was located approximately 34 m southeast of the former shoreline within an unnamed road leading to the Immigrant Depot (on present-day Ala Moana Boulevard). In a map of Honolulu by W. A. Wall (1887), the unnamed road is named Kaka'ako Street and the area of the former shoreline has become reclaimed land with proposed development, moving the shoreline to below present-day Ala Moana Boulevard. According to M. D. Monsarrat's 1897 map of Honolulu, the location of T-227A was still an undeveloped area and along a small street intersecting with Punchbowl Street. In Newton's 1904 map of Honolulu the small street has become an extension of Punchbowl Street and the location of T-227A was next to Honolulu Iron Works. The 1919 U.S. Army War Department map of Honolulu indicated the location of T-227A as within Punchbowl Street.

Previous archaeology of the surrounding area includes two primary studies. In 1985, excavations conducted at the former location of the Honolulu Iron Works encountered five human burials in a parcel of land between Punchbowl Street and South Street and from Pohukaina Street to near Ala Moana Boulevard (Yent 1985). The Department of Land and Natural Resources conducted the fieldwork and identified the burials in a sand deposit within burial pits located beneath approximately 1 m of fill. The exact location of the five burials within the study area was not recorded, although the report notes the construction site as being at the intersection of Punchbowl Street and Pohukaina Street. The northwestern border of the study area at this

intersection is approximately 20 m southeast of T-227A. All five burials were assigned SIHP #50-80-14-2918 and were disinterred.

Between 1986 and 1988, CSH conducted archaeological monitoring within the Hawai'i Community Development Authority's Kaka'ako Improvement District 1 (ID-1), which included Punchbowl Street and the location of T-227A (Pfeffer et al. 1993). A total of 149 burials were documented and disinterred during archaeological monitoring within Kaka'ako Improvement District 1 from four specific burial areas: Queen Street (116 burials assigned SIHP #50-80-14-4534); South Street (31 burials assigned SIHP #50-80-14-3712); Halekauwila Street (1 burial assigned SIHP #50-80-14-4532); and Punchbowl Street (1 burial assigned SIHP #50-80-14-4533). The one burial that was identified on Punchbowl Street was located at the King Street intersection, approximately 514 m northeast of T-227A.

**Documentation Limitations:** T-227A was excavated to the coral shelf at a depth of 1.40 mbs. The water table was not encountered during the excavation. Excavation was limited in the southern end of T-227A due to the presence of a metal pipe at 0.90 mbs. A backhoe was used to remove the upper fill strata and expose the underlying natural sediment. All of the natural sediment within T-227A was hand-excavated to the coral shelf.

A partial human (infant) burial was encountered at approximately 1.15 mbs in the northern end of the excavation. No burial pit was observed and only skeletal elements from the upper half of the burial were observed; including portions of the skull, humeri, and cervical vertebrae. The age of the individual was determined to be between birth to three years. Excavation was stopped in the immediate vicinity of the burial. The remains were covered and secured and a buffer was emplaced around the burial within the excavation.

Five features (Features 22–27) were identified within T-227A (see Features Discussion below). Each feature was documented and sampled.

**Stratigraphic Summary:** The stratigraphy of T-227A consisted of fill overlying the former land surface and natural sediment to the coral shelf. Observed strata included asphalt (Ia), gravel base course (Ib), loamy sand fill (Ic), and silty sand fill (Id), overlying a loamy sand buried cultural A-horizon (II), natural Jaucas sand (III), and natural sand with clay (IV) over the coral shelf. The buried A-horizon (II) of T-227A has been classified under SIHP #50-80-14-2918, a designation given to the subsurface cultural deposit in the area. The stratigraphy of T-227A did not conform to the USDA soil survey designation of Fill land.

**Artifacts Discussion:** Twenty-nine (29) historic artifacts (Acc. #227A-A-1 to A-16, see following table and photographs) were collected, six ceramic fragments from four vessels in Stratum Id, 14 glass fragments from seven bottles in Stratum Id, and nine glass fragments from six bottles in Stratum II. There are a number of 'black' glass bottle fragments from both Stratum Id and II; these span the mouth-blown era into the mold-blown period (pre-1890). One case gin bottle has a pontil, indicating that it was mouth blown; case gin bottles were still mouth-blown into the 1920s. Collected artifacts from both Strata Id and II likely date to the 1870s–1920s.

Fire-cracked rock also was encountered in the buried A-horizon (Stratum II). Additional traditional and historic materials were encountered within the sediment samples obtained from the potential pit features and for Stratum II (A-horizon) (see Sample Results below).

**Features Discussion:** A total of five features (Features 22–27) were documented within T-227A. Features 22–24 were observed in plan view while Features 25–27 were observed in the central portion of the southeast sidewall profile. Features 22–26 were documented as pit features originating within Stratum II and extending into Stratum III (Jaucas sand). Feature 27 was a partial infant burial. The buried A-horizon (II) and the infant burial were designated as components of SIHP #50-80-14-2918, which was also identified within T-226A, T-226B, T-226C, T-226D, and T-227. The five features within T-227A were designated as Features 22–27 of SIHP #50-80-14-2918. SIHP #50-80-14-2918. Features 14–21 were identified within T-227.

SIHP #50-80-14-2918 Feature 22 was square-shaped in plan view in the central area of the excavation. The feature was approximately 30 cm by 30 cm long, originating at the base of Stratum II from 1.03–1.08 mbs. Approximately 1.5 gallons of sediment was removed from the feature, screened, and collected for further content analysis. The screened sample from Feature 22 yielded shell midden material (1.7 g), fish bones (0.4 g), fire-cracked rock and a brick fragment (106.3 g), and a basalt fragment (13.1 g). The shell material was classified as a Turbinidae (*Turbo sp.*) operculum (1.1 g), Tellinidae (*Tellina palatam*) (0.4 g), and Mytilidae (*Brachidontes crebristriatus*) (0.2 g). The fish bone fragments were not identifiable to the species level. The function of Feature 22 is indeterminate.

SIHP #50-80-14-2918 Feature 23 had a circular shape in plan view near the northern end of the excavation. The feature was approximately 20 cm in diameter, originating at the base of Stratum II from 1.08-1.31 mbs. Sediment samples from Feature A included an approximate one gallon screened sample and a two liter bulk sediment sample. The sample results for the samples were combined and yielded < 0.1 g of charcoal and 5.7 g of shell material which was classified as Conidae (*Conus sp.*) (2.5 g), Turbinidae (*Turbo sp.*) operculum (1.2 g), Mytilidae (*Brachidontes crebristriatus*) (0.8 g), Neritidae (*Theodoxus neglectus*) (0.6 g), Turbinidae (*Turbo sandwicensis*) (0.4 g), and a gastropod fragment (0.2 g). Wood taxa analysis was conducted on the charcoal material and classified as the native trees of *kōpiko* (cf. *Psychotria sp.*) (0.07 g) and *lama* (*Diospyros sandwicensis*) (< 0.01 g), and a sample of unidentified bark (< 0.01 g). Feature 23 is interpreted as a pit of indeterminate function.

SIHP #50-80-14-2918 Feature 24 had an ovoid shape in the plan view of the excavation. The feature was approximately 17 cm long by 12 cm wide, originating at the base of Stratum III from 1.17-1.30 mbs. A two liter bulk sediment sample from Feature 24 yielded shell material (3.8 g), unidentified osseous remains of a medium mammal (0.1 g), and a shark tooth (0.1 g). The shell material was classified as Turbinidae (*Turbo sandwicensis*) (1.4 g), Mytilidae (*Brachidontes crebristriatus*) (1.2 g), Strombidae (*Strombus sp.*) (0.9 g), Echinodermata *diadema sp./mathaei sp.* (0.2 g), and crustacean (0.1 g). Feature 24 is interpreted as a pit of indeterminate function.

SIHP #50-80-14-2918 Feature 25 was a tapered pit observed in the southeast sidewall profile of the excavation. The feature had a maximum width of 20 cm originating at the base of Stratum II from 0.94–1.08 mbs. A 1.5 liter bulk sediment sample from Feature 25 yielded shell material (1.0 g), volcanic glass (0.2 g), and fish bone (0.1 g). The shell material was classified as limpets/gastropods (0.7 g), Mytilidae (*Brachidontes crebristriatus*) (0.2 g), and Tellinidae (0.1 g). The volcanic glass is considered to be a traditional Hawaiian artifact. Feature 25 is interpreted as a pit of indeterminate function.

SIHP #50-80-14-2918 Feature 26 was a straight-edged pit observed in the southeast sidewall profile of the excavation. The feature had a maximum width of 20 cm originating at the diffuse lower boundary of Stratum II and extending into Stratum III from 1.12–1.37 mbs. A two liter bulk sample from Feature 26 yielded shell material (1.5 g) and faunal remains (0.5 g). The shell material was classified as Neritidae (*Nerita picea*) (0.8 g), Naticidae (*Natica sp.*) (0.5 g), crustacean (0.1 g), and Mytilidae (*Brachidontes crebristriatus*) (0.1 g). The faunal remains were consistent with a medium mammal (*cf. Canis lupus familiaris*) and included an incisor tooth fragment and an irregular fragment. Feature 26 is interpreted as a pit of indeterminate function.

SIHP #50-80-14-2918 Feature 27 was a partial infant burial observed at the base of the Jaucas sand layer (Stratum III) extending into Stratum IV. The burial had no discernible pit outline. The burial was determined to be an infant between 0–3 years based on the size and growth development of the remains. Ancestry determination on infant remains is not possible.

**Terrestrial Faunal Remains Collected During Excavation:** Faunal remains were encountered in the fill (Stratum Id) and within the former A-horizon (Stratum II) and Jaucas sand (Stratum III). Osseous remains from Stratum Id included: cow (*Bos taurus*) rib and pelvis fragments with characteristic butcher cut marks; a fish vertebra and spine; and pig (*Sus scrofa*) ulna fragment, long bone diaphysis sections with cut marks, rib and vertebrae fragments, and incisor fragments. Faunal remains from Stratum II were identified as follows: goat (*Capra aegagrus hircus*) cranial fragments, proximal phalanx, and a vertebral facet portion; a dog (*Canis lupus familiaris*) cranial fragment, teeth (molar and canine), metacarpal fragment, vertebral facet fragment, ulna fragment, and long bone diaphysis portion; fish bones including Hawaiian Hogfish, or Labridae (*Bilunulatus alboteniatus*), bones and unidentified fish spines and fragments; and a diaphysis section from an unidentified species, not consistent with human. The presence of goat remains indicated a post-Contact origin, as goats were non-native to Hawai'i. Stratum III contained osseous remains consisting of a pig (*Sus scrofa*) canine fragment and also diaphysis sections from an unidentified species, not consistent with human. Additional osseous remains consistent with a medium mammal and fish were encountered within features as described above. Most of the fragmented faunal material likely represents food remains.

**Sample Results:** An additional 20 gallon screened sample was collected from Stratum II (A-horizon) from between 0.80–0.90 mbs for further content analysis. The screened sample from Stratum II yielded charcoal (3.2 g), abundant shell material (108.1 g); historic artifacts consisting of green, aqua, clear, and bottle glass fragments (6.8 g), medium mammal osseous material (1.2 g), and fish bones (1.2 g). The shell material, consistent with midden shell, included: Mytilidae (*Brachidontes crebristriatus*) (25.8 g), Conidae (*Conus sp.*) (18.2 g), Neritidae (*Theodoxus neglectus*) (12.9 g), Strombidae (*Strombus sp.*) (8.4 g), Tellinidae (*Tellina palatam*) (8.1 g), Cypraeidae (*Cypraea caputserpentis*) (8.0 g), Turbinidae (*Turbo sandwicensis*) (5.5 g), Neritidae (*Nerita picea*) (5.2 g), Cypraeidae (*Cypraea erosa*) (3.7 g), Trochidae (*Trochus sp.*) (2.7 g), Isognomonidae (*Isognomon sp.*) (1.2 g), Thaididae (*Drupa sp.*) (1.2 g), Pteriidae (*Pinctada radiata*) (1.1 g), Nassariidae (1.0), Echinodermata *diadema sp.* (0.9 g), crustacean (0.8 g), Cymatiidae (0.5 g), Naticidae (*Natica sp.*) (0.5 g). Non-midden shell material was identified as Hipponicidae (2.1 g), Melampidae (*Melampus castaneus*) (0.2 g), and Tellinidae (0.1 g).

Additional shell midden material was collected from Stratum II during the excavation of T-227A. The collected sample was identified as: Tellinidae (*Tellina palatam*) (11.0 g), Strombidae

(*Strombus maculatus*) (10.8 g), Neritidae (*Theodoxus neglectus*) (9.1 g), Turbinidae (*Turbo sandwicensis*) (8.6 g), Conidae (*Conus sp.*) (7.8 g), Cymatiidae (*Cymatium nicobarium*) (7.6 g), Mytilidae (*Brachidontes crebristriatus*) (4.1 g), Cypraeidae (*Cypraea caputserpentis*) (2.3 g), Neritidae (*Nerita picea*) (2.1 g), Turbinidae (*Turbo sp.*) operculum (1.9 g), Isognomidae (*Isognomon sp.*) (1.5 g).

Radiocarbon analysis of the wood identified from Feature 23 yielded three possible date ranges, with a calibrated 2-sigma date of AD 1720 to AD 1810 (51.6%) being the most probable (see Radiocarbon Results located at the end of Section 3.13).

Two volcanic glass samples from Stratum II between 0.94–1.08 mbs, and 1.08–1.31 mbs were sent for EDXRF analysis. Specific source information is not available; however, the volcanic glass sample clearly does not match sources from Hawai'i Island. The sample from Stratum II at 0.94–1.08 mbs was from "Group 2" while the sample from Stratum II at 1.08–1.31 mbs was from "Group 1." Two distinct geochemical groups were identified from the 35 City Center AIS EDXRF volcanic glass samples, likely representing different volcanic sources on O'ahu (see EDXRF discussion in Volume IV).

**GPR Discussion:** A review of amplitude slice maps indicated no linear features although a utility was encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.25 mbs.

GPR depth profiles for T-227A identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.25 mbs. No utilities were observed in the profile however a utility was encountered during excavation. The maximum depth of clean signal return was approximately 0.8 mbs.

**Summary:** T-227A was excavated to the coral shelf at a depth of 1.40 mbs. The water table was not encountered during the excavation. The stratigraphy of T-227A consisted of fill (Ia–Id) overlying the former land surface (II) and natural sediment (III–IV) to the coral shelf. The stratigraphy of T-227A did not conform to the USDA soil survey designation of Fill land. Artifacts observed from the lowermost fill layer (Stratum Id) consisted of broken bottle glass and ceramic fragments dating between the late nineteenth to early twentieth century. Overall, material contained within the features and Stratum II (former A-horizon) consisted of various shell midden and naturally occurring shell species. A total of five features (Features 22–27) were documented within T-227A. Features 22–26 were documented as pit features originating within Stratum II and extending into Stratum III (Jaucas sand). Feature 27 was a partial infant burial. The partial infant burial was observed at the base of the Jaucas sand layer (Stratum III) extending into Stratum IV, and no pit outline was visible. The burial was determined to be an infant between 0–3 years based on the size and growth development of the remains. Ancestry determination on infant remains is not possible. However, the infant's ancestry is most likely Native Hawaiian, which is supported by the stratigraphic context below the former A-horizon (Stratum II). A small amount of fish bones (0.6 g total), including a shark tooth, were contained within Features 22, 24, and 25. Feature 22 also contained fire-cracked rock and a red brick fragment. Feature 23 also contained charcoal (< 0.1 g) which was identified as originating from

the native trees of *kōpiko* (cf. *Psychotria* sp.) and *lama* (*Diospyros sandwicensis*). Feature 25 also contained volcanic glass (0.2 g), which is considered to be a traditional Hawaiian artifact. Osseous fragments were also encountered within Feature 24 (0.1 g; unidentified non-human species) and Feature 26 (0.5 g; cf. *Canis lupus familiaris*). Additional faunal remains were encountered in the fill (Stratum Id) and within the former A-horizon and (Stratum II) and Jaucas sand (III). Stratum Id contained butchered cow (*Bos taurus*) and pig (*Sus scrofa*) bones. The osseous remains from Stratum II (A-horizon) were identified as originating from goat (*Capra aegagrus hircus*), dog (*Canis lupus familiaris*), fish, and an unidentified species, not consistent with human. The presence of goat remains indicated a post-Contact origin, as goats were non-native to Hawai'i. Stratum III (Jaucas sand) contained remains from a pig (*Sus scrofa*) and a long bone fragment from an unidentified species, not consistent with human. Most of the fragmented faunal material likely represents food remains. The cultural content of the buried A-horizon and the presence of the Features 22–27 support the utilization of the former land surface (Stratum II) as a pre- to post-Contact human activity area. The five features within T-227A were designated as Features 22–27 of SIHP #50-80-14-2918. SIHP #50-80-14-2918. The buried A-horizon (II) and the infant burial were designated as components of SIHP #50-80-14-2918, which was also identified within T-226A, T-226B, T-226C, T-226D, and T-227 and is further described in Volume I.



T-227A general location, view to north



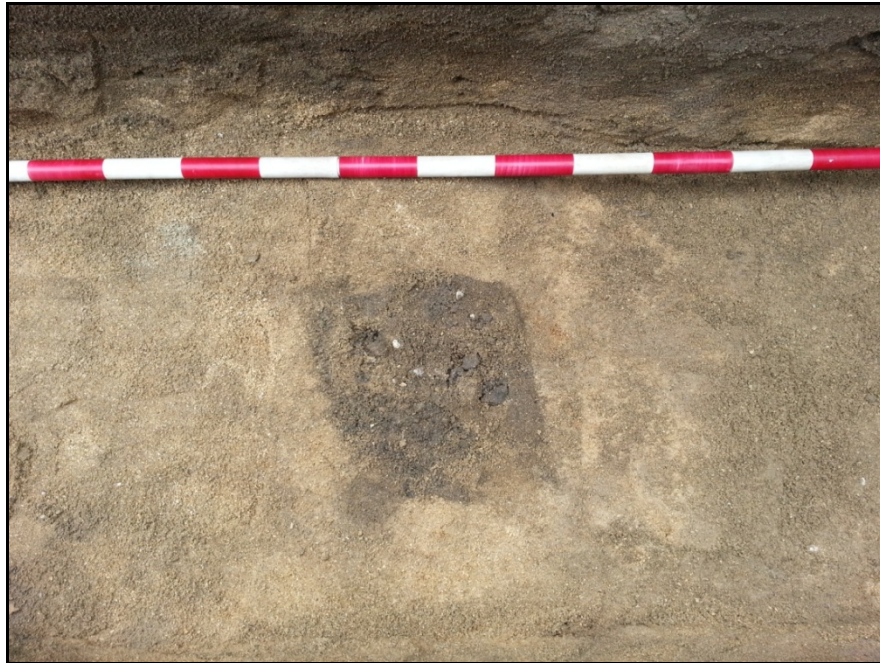


T-227A southeast wall, view to south



T-227A northwest wall, view to west





Plan view of Feature 22 in T-227A, view to southeast



Plan view of Feature 23 near northern end of T-227, view to south





Plan view of Feature 24 in T-227A, view to south

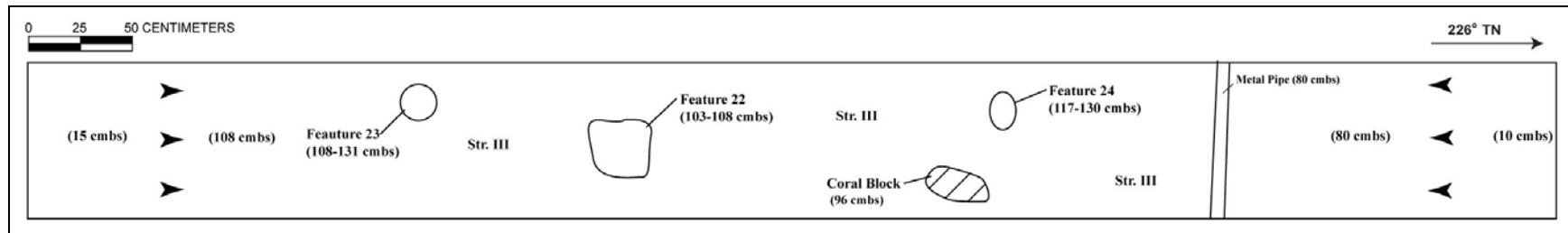


Feature 25 in southeast profile of T-227A, view to southeast

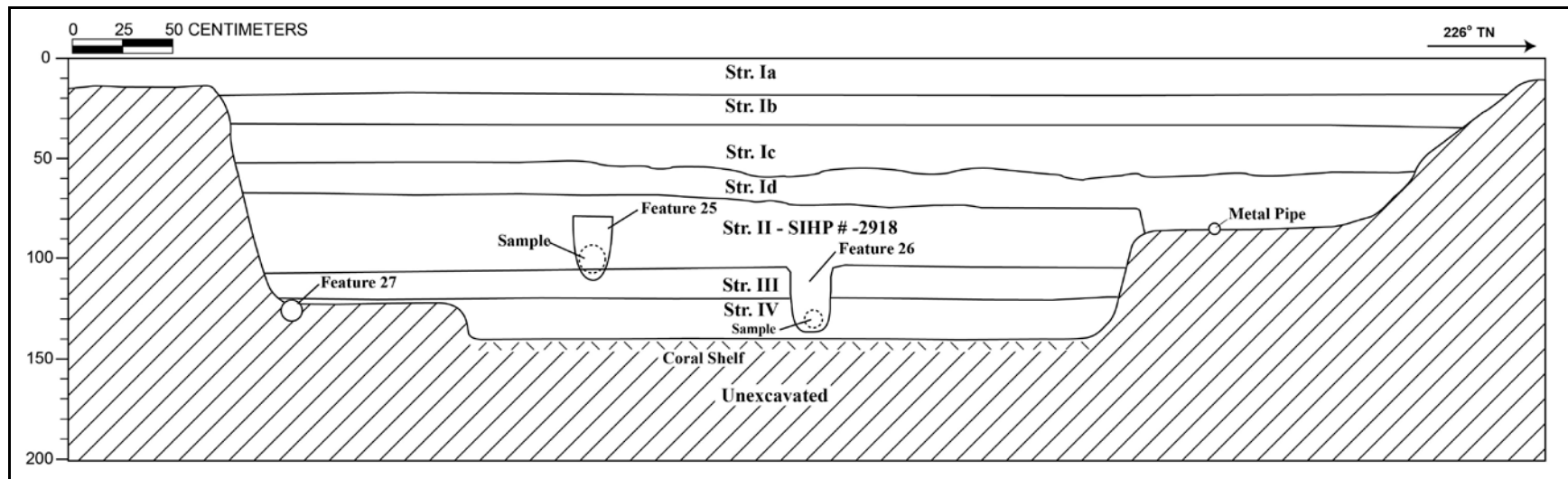




Feature 26 in southeast profile of T-227A, view to south



T-227A plan view



T-227A southeast wall profile

## T-227A Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0–18	Asphalt; road surface
Ib	18–33	Fill; crushed basalt gravel base course fill
Ic	33–60	Fill; 10 YR 4/2 (dark grayish brown) mottled with 5% lenses of 10 YR 8/1 (white); loamy sand; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; imported fill
Id	52–75	Fill; 2.5 Y 4/2 (dark grayish brown); silty sand; weak, fine, granular structure; moist, very friable consistency; non-plastic; mixed origin; clear, smooth lower boundary; contained faunal bone, bottle glass fragments, ceramic fragments, and rusted metal
II	68–108	A-horizon; 10 YR 4/3 (brown); loamy sand; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; diffuse, wavy lower boundary; contained fire-cracked rock and abundant marine shell; buried former land surface
III	102–120	Natural; 2.5 Y 7/4 (pale yellow); medium sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; diffuse, smooth lower boundary; Jaucas sand
IV	120–140	Natural; 2.5 Y 7/2 (light gray); sand with clay; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; overlying coral shelf

## T-227A Artifact Analysis

Acc. #227A-A-	Provenience	Ceramic Vessel Type	Portion	No.	Paste; Decor.	Origin; Age	Comments
1	T-227A, St. Id	Dinnerware	Base	2	Porcelain; Painted underglaze		
2	T-227A, St. Id	Flatware	Rim (1); body (2)	3	Earthenware, Refined; Transfer print		
3	T-227A, St. Id	Dinnerware	Body to rim	1	Porcelain; Painted underglaze		Unknown pattern on fragment and rim
Acc. #227A-A-	Provenience	Glass Bottle Type	Portion	No.	Color	Origin; Age	Comments
4	T-227A, St. Id	Bottle, Beverage	Base	1	Black	pre-1890s	Push-up
5	T-227A, St. Id	Bottle, Gin	Base	1	Olive, Dark	1920s-pre	Open Pontil Case Gin
6	T-227A, St. Id	Bottle, Beverage	Neck-lip	1	Black	pre-1920	
7	T-227A, St. Id	Bottle	Body	1	Clear	1870s-post	
8	T-227A, St. Id	Bottle	Body	1	Green, Light		
9	T-227A, St. Id	Bottle, Beverage	Body	3	Olive, Dark		
10	T-227A, St. Id	Bottle, Beverage	Base	5	Olive, Dark	ca. 1860s-post	"AIT", ...ALTT...KL... embossing
11	T-227A, St. II	Bottle	Base	2	Black	pre-1890s	
12	T-227A, St. II	Bottle	Base	2	Black	pre-1890s	
13	T-227A, St. II	Bottle	Base	1	Black	pre-1890s	
14	T-227A, St. II	Bottle	Body	1	Olive, Dark	1860s-post	Embossed with a "...LE" vertically on the body
15	T-227A, St. II	Bottle	Body	1	Olive, Dark		
16	T-227A, St. II	Bottle	Body	21	Amber	—	





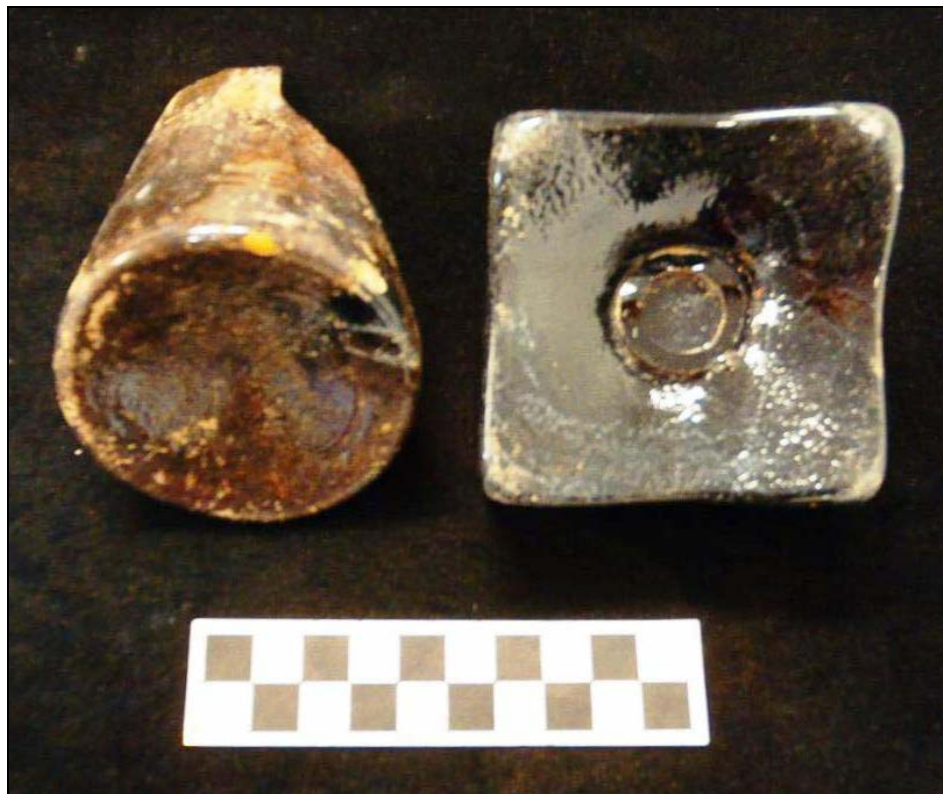
T-227A ceramic fragments (Acc. #227A A-1 to A-3) interior, from Stratum Id



T-227A ceramic fragments Acc. #227A A-1 to A-3) interior, from Stratum Id



T-227A glass bottle fragments (Acc. #227A-A-4 to A-10) interior, from Stratum Id



T-227A glass bottle artifact (Acc. #227A-A-4 to A-5), from Stratum Id

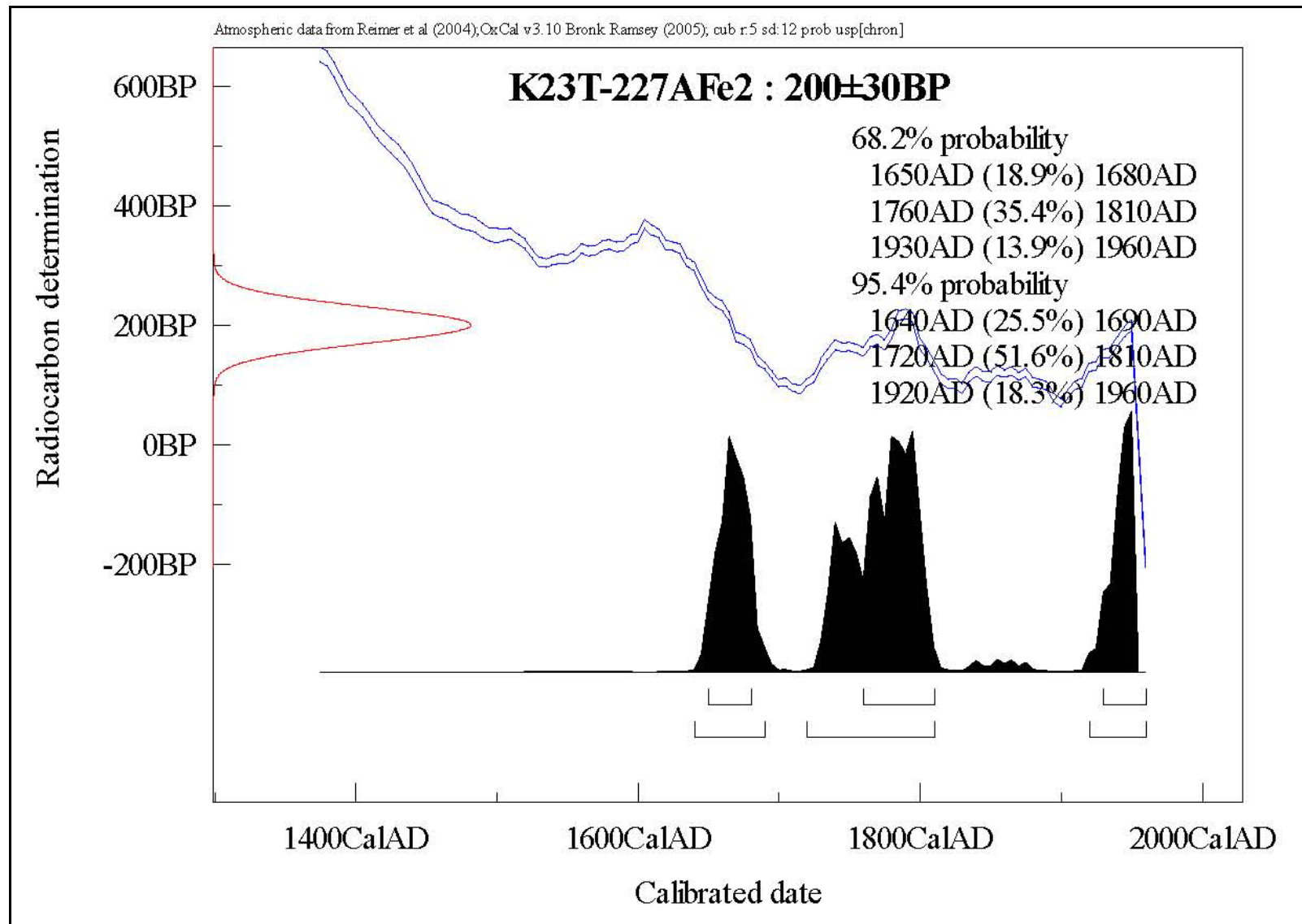




T-227A glass bottle fragments (Acc. #227A-A-11 to A-16), from Stratum II

## T-227A Faunal Analysis Table

Acc. #	Stratum	Depth(cmbs)	Feature	Family/Class	Species	Element	Description	Modification
227A-F-1	Id	63	—	Bovidae (cow)	<i>Bos taurus</i>	Ribs; Innominate	Fragments	Butchered (cut with metal blade)
227A-F-2	Id	63	—	Suidae (pig)	<i>Sus scrofa</i>	Ulna; Diaphysis section; Rib; Incisors; Vertebra; Vertebra with facets	Fragments	Diaphysis section butchered (cut with metal blade)
227A-F-3	II	68-108	—	Bovidae (goat)	<i>Capra aegagrus hircus</i>	Cranial; Vertebral facets; Proximal phalanx	Fragments	None
227A-F-4	II	68-108	—	Mammalia	Medium mammal	Diaphysis sections	Fragments	None
227A-F-5	II	80-90	—	Canidae (dog)	<i>Canis lupus familiaris</i>	Cranial; Molar; Canine; Vertebral facets; Ulna; Diaphysis section; Metacarpal	Fragments	None
227A-F-6	III	100	—	Suidae (pig)	<i>Sus scrofa</i>	Canine	Fragment	None
227A-F-7	III	100	—	Mammalia	Medium mammal	Diaphysis sections	Fragments	None



T-227A Feature 23 results of radiocarbon analysis

## 4.14 Test Excavation 227B (T-227B)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6 [Plat]
<b>TMK #:</b>	2-1-027
<b>Elevation Above Sea Level:</b>	1.55 m
<b>UTM:</b>	618017.9387 m E 2356048.119 m N
<b>Max Length/Width/Depth:</b>	6.74 m / 0.79 m / 1.45 mbs
<b>Orientation:</b>	144 / 324° TN
<b>Targeted Project Component</b>	Utility Relocation
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 227B (T-227B) was located in the right lane of the west (*`ewa*) bound Pohukaina Street near the intersection with Punchbowl Street. Existing utilities near T-227B included two gas lines approximately 2.0 m and 7.0 m to the northeast; two water lines parallel with the excavation area, approximately 2.1 m and 3.5 m to the southwest; a parallel drain line 4.5 m to the southwest which crosses the excavation area perpendicularly 2.8 m to the northwest; and a sewer line less than 7.5 m to the southeast. T-227B was located on property owned by the City and County of Honolulu. T-227B was added to further investigate subsurface cultural deposits designated SIHP # 50-80-14-2918. This test excavation also investigated a utility relocation. The excavation area was level with the surrounding land surface.

**Summary of Background Research and Land Use:** Land Court Application 345 Map 1 indicated that T-227B was originally situated on land awarded to V. Kamāmalu as part of LCA 7712. S. E. Bishop's map of the Kewalo area of Honolulu (1884) indicated that T-227B was located approximately 53 m southeast of the former shoreline, in an undeveloped area less than 20 m west of an unnamed road leading to the Immigrant Depot (on present-day Ala Moana Boulevard. In a map of Honolulu by W. A. Wall (1887), the unnamed road is named Kaka'ako Street, the area of the former shoreline has become reclaimed land with proposed development, moving the shoreline to below present-day Ala Moana Boulevard, and the immediate vicinity around T-227B remains undeveloped. According to M. D. Monsarrat's 1897 map of Honolulu, the location of T-227B was still an undeveloped area and Kaka'ako Street intersected and extended from Punchbowl Street. In Newton's 1904 map of Honolulu the small street has become an extension of Punchbowl Street and the location of T-227B was fronting the northeast side of Honolulu Iron Works in an unnamed (Pohukaina) Street, which has remained unchanged in its present-day location.

Previous archaeology of the surrounding area includes two primary studies. In 1985, excavations conducted at the former location of the Honolulu Iron Works encountered five human burials in a parcel of land between Punchbowl Street and South Street and from Pohukaina Street to near Ala Moana Boulevard (Yent 1985). The Department of Land and Natural Resources conducted the fieldwork and identified the burials in a sand deposit within burial pits located beneath approximately 1 m of fill. Although the exact location of the five burials within the study area was not recorded, the report notes the construction site as being at the intersection of Punchbowl

Street and Pohukaina Street. The northwestern border of the study area at this intersection is less than 15 m southwest of T-227B. All five burials were assigned SIHP #50-80-14-2918 and were disinterred.

Between 1986 and 1988, CSH conducted archaeological monitoring within the Hawai'i Community Development Authority's Kaka'ako Improvement District 1 (ID-1), which included Pohukaina Street and the location of T-227B (Pfeffer et al. 1993). A total of 149 burials were documented and disinterred during archaeological monitoring within Kaka'ako Improvement District 1 from four specific burial areas: Queen Street (116 burials assigned SIHP #50-80-14-4534); South Street (31 burials assigned SIHP #50-80-14-3712); Halekauwila Street (1 burial assigned SIHP #50-80-14-4532); and Punchbowl Street (1 burial assigned SIHP #50-80-14-4533). The one burial that was identified on Punchbowl Street was located at the King Street intersection, approximately 492 m northeast of T-227B.

**Documentation Limitations:** T-227B was excavated to a depth of 1.45 mbs in natural sediment at the coral shelf and beneath the water table, which was present at 1.32 mbs. Excavation was limited in the southwestern end due to a metal pipe encountered at 0.60 mbs. A combination of backhoe and hand excavation was used to remove the asphalt and upper fill layers (Strata Ia–Id). Hand excavation commenced through the underlying trash fill layer (Stratum Ie) to the coral shelf.

**Stratigraphic Summary:** The stratigraphy of T-227B consisted of fill overlying natural sediment. Observed strata included asphalt (Ia), gravel base course (Ib), hydraulic sand fill (Ic–Id), and gravelly silty loam fill (Ie), overlying a natural silty clay (II) above the coral shelf. Stratum Ie contained much cultural material and is interpreted as an imported trash fill layer used for land reclamation along with the hydraulic fill layers (Stratum Ic–Id). The stratigraphy conformed to the USDA soil survey designation of Fill land.

**Artifacts Discussion:** Historic artifacts were collected from the imported trash fill (Stratum Ie), including various glass bottles, a horseshoe, red brick portions, and ceramic fragments. The bottle glass fragments dated between the late nineteenth to early twentieth century.

**Terrestrial Faunal Remains Collected During Excavation:** Faunal remains from T-227B consisted of cow (*Bos taurus*) rib fragments, a chicken (*Gallus gallus*) long bone fragment, and pig (*Sus scrofa*) remains, which were all encountered in the trash fill (Stratum Ie). The osseous material identified as pig included: a subadult left maxillary fragment containing the third premolar, first and second molars, and unerupted third molar, in addition to a separated tooth fragment. Today, pigs usually are butchered from 9 to 12 months old, meaning that many of the bones and teeth would not be fully developed. The cow rib fragments exhibit cut marks characteristic of butchering. Most likely all of the faunal material encountered represents modern or historic food remains.

**Sample Results:** A total of six liters of bulk sediment samples were collected from Stratum II (natural silty clay) between 1.30–1.40 mbs in the central area of the excavation for further content analysis and any indication of cultural deposits. The bulk sample from Stratum II yielded 14 g of non-midden shell material, 0.4 g of unidentified wood fragments, and 0.1 g of unidentified fish bones. The shell material was classified as Mytilidae (*Brachidontes crebristriatus*) (7.8 g), Tellinidae (2.3 g), Tellinidae (*Tellina palatam*) (1.3 g), Echinodermata

(crustacean, and shell fragments) (0.8 g), gastropod fragments (0.6 g), Naticidae (*Natica sp.*) (0.5 g), Echinodermata *mathaei sp.* (0.3 g), Hipponicidae (*Hipponix sp.*) (0.2 g), Carditidae (*Fragum mundum*) (0.1 g), and crustacean (0.1 g). The results of sample analysis support the identification of Stratum II as naturally-deposited sediment.

**GPR Discussion:** A review of amplitude slice maps indicated no linear features although a utility was encountered during excavation. Reflectivity is relatively uniform throughout the grid. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.25 mbs and increases again around 0.75 mbs.

GPR depth profiles for Excavation 227B identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 0.3 mbs. No utilities or anomalies were observed in the GPR profile, although a utility was encountered during excavation. The maximum depth of clean signal return was approximately 1.25 mbs.

**Summary:** T-227B was excavated to a depth of 1.45 mbs in natural sediment at the coral shelf and beneath the water table, which was present at 1.32 mbs. The stratigraphy of T-227B consisted of fill (Ia–Ie) overlying natural sediment (II). The stratigraphy conformed to the USDA soil survey designation of Fill land. Historic artifacts analysis indicated the bottle glass fragments dated between the late nineteenth to early twentieth century. Faunal remains from T-227B consisted of cow (*Bos taurus*) rib fragments, a chicken (*Gallus gallus*) long bone fragment, and pig (*Sus scrofa*) remains, which were all encountered in the trash fill (Stratum Ie). Most likely all of the faunal material encountered represents modern or historic food remains. A total of 6 liters of bulk sediment samples were collected from Stratum II (natural silty clay) between 1.30–1.40 mbs in the central area of the excavation for further content analysis and any indication of cultural deposits. The results of sample analysis support the identification of Stratum II as naturally-deposited sediment. No archaeological cultural resources were identified within T-227B.





T-227B general location, view to northwest



T-227B at base of excavation showing metal pipe and buffer in west corner, view to northeast

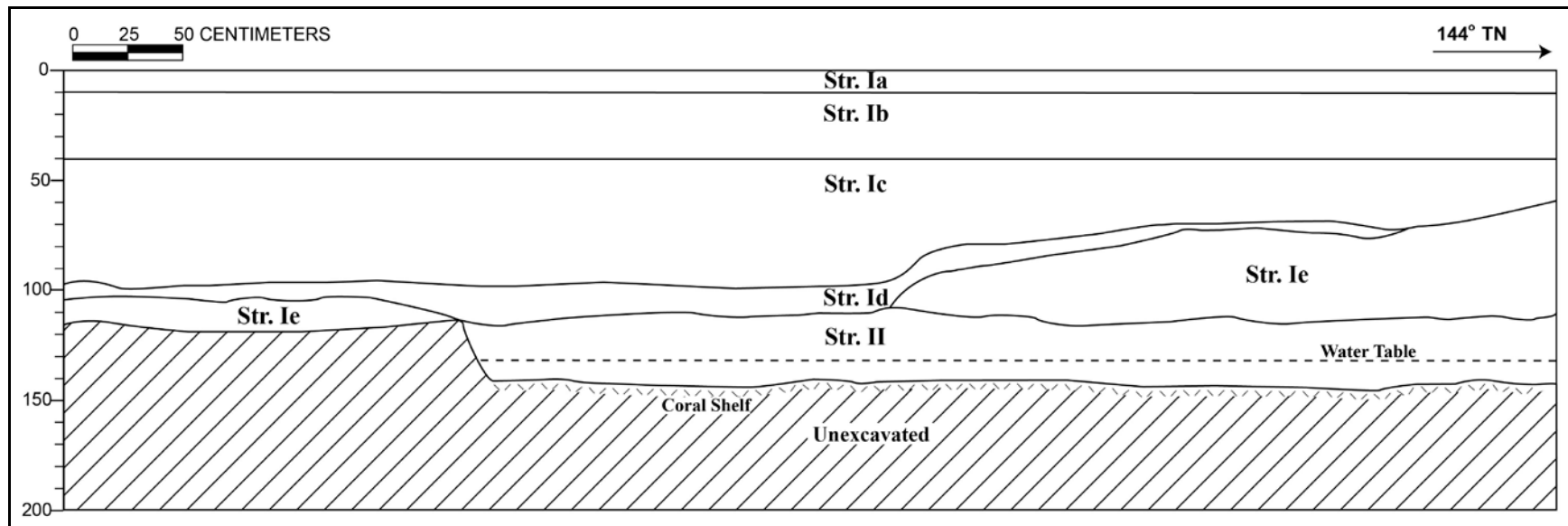




T-227B southeast wall, view to south



T-227B northwest wall, view to west



T-227B northeast wall profile

## T-227B Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0–10	Asphalt; road surface
Ib	10–40	Fill; 5 YR 3/3 (dark reddish brown); extremely gravelly loamy sand with about 80% subangular basalt gravel; structureless, single-grain; dry, loose consistency; no cementation; non-plastic; mixed origin; clear, smooth lower boundary; base course fill
Ic	40–99	Fill; 10 YR 8/4 (very pale brown); very fine grain sand; weak, fine granular structure; moist, very friable consistency; non-plastic; marine origin; very abrupt, smooth lower boundary; land reclamation fill
Id	68–115	Fill; 10 YR 5/1 (gray); very fine grain silty sand; structureless, massive; moist, very friable structure; non-plastic; marine origin; abrupt, irregular lower boundary; land reclamation fill
Ie	60–120	Fill; 10 YR 2/3 (very dark brown); gravelly silt loam; moderate, medium, blocky structure; moist, very friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; few, fine to medium roots; contained cultural material; imported trash fill
II	107–145	Natural; GLEY 1 5/N (gray); silty clay; structureless, massive; wet, slightly sticky consistency; plastic; lower boundary not visible; natural wetland sediment, becomes more sandy at bottom of layer; overlying coral shelf

## 4.15 Test Excavation 228 (T-228)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6
<b>TMK #:</b>	N/A
<b>Elevation Above Sea Level:</b>	1.75 m
<b>UTM:</b>	618089.5991mE, 2355966.028mN
<b>Max Length/Width/Depth:</b>	6.2 m / 0.70 m / 1.80 mbs
<b>Orientation:</b>	320 / 140° TN
<b>Targeted Project Component:</b>	Utility Relocation
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 228 (T-228) is located within the roadcut of Pohukaina Street (property owned by City and County of Honolulu), bordered by South Street to the east and Punchbowl Street to the west. T-228 is level with the surrounding roadcut surface. The historic shoreline was located 1.7 m southeast of the location of T-228. Utilities surrounding T-228 include a sewage line (3.5 m to the south) and a water line (5 m to the south).

**Summary of Background Research and Land Use:** Background research indicated that in 1884 the location of T-228 was in an undeveloped area, with structures located 100 m to the southwest and the immigration depot located 140 m south to the south, according to S.E. Bishop's 1884 map of Honolulu. By 1887, the Map of Honolulu by W. A. Wall showed T-228 still within an undeveloped area, with three ponds located 150 m to the north. The 1897 map of Honolulu by M. D. Monsarrat indicated large scale industrial development 200 m to the southwest and three ponds 150 m to the north, with T-228 still located within an undeveloped area. Newton's 1904 Honolulu Buildings map indicated continued industrial development to the southwest, a Honolulu Iron Works structure 11 m *makai*, and disappearance of the ponds to the north which have been filled in. The 1919 U.S. Army War Department map showed T-228 was located within the center of a structure, with urban development (structures, grid pattern, and roads) in the immediate vicinity. The 1943 U.S. Army War Department map showed continued heavy urban development, and by 1953 T-228 is located within its modern position inside of the roadcut, according to the 1953 topographic map by the U.S. Army Mapping Service.

Previous archaeology of the surrounding area includes several studies. In 1985, excavations conducted at the former location of the Honolulu Iron Works encountered five human burials in a parcel of land between Punchbowl Street and South Street and from Pohukaina Street to near Ala Moana Boulevard (Yent 1985). The exact location of the five burials within the study area was not recorded although the report notes the construction site as being at the intersection of Punchbowl Street and Pohukaina Street. The boundary of the study area was located just southwest of T-228. During monitoring for the Judiciary Parking Garage, at the north corner of Pohukaina and South Streets approximately 1.5 m east of T-228, concentrations of historic artifacts (mainly glass bottles) designated SIHP #50-80-14-1973 (Athens 1986). Subsequent analysis of the post-Contact artifact material determined that the most likely time frame for the

manufacture and disposal of the historic artifacts was between 1880 and 1930(Leidemann 1988). A 2011 survey identified four historic properties (SIHP #50-80-14-7124, -7189, -7190 and -7197), including burned historic debris, salt pan remnants, and a cultural layer containing one late pre-Contact/early post-Contact fire pit features approximately 100 m northeast of T-228 (Pammer et al. 2011).

**Documentation Limitations:** T-228 was excavated to 1.80 mbs and beneath the water table at 1.60 mbs. There were no factors that limited the excavation of T-228.

**Stratigraphic Summary:** The stratigraphy of T-228 consisted of fill strata to the base of excavation at 1.80 mbs. Observed strata included asphalt (Ia), very gravelly sandy loam (Ib), extremely stony gravelly coarse sand (Ic), gravelly, cobbly sand (Id), and extremely gravelly stony sand (Ie). The stratigraphy conformed to the USDA soil survey designation of Fill land.

**Artifacts Discussion:** No artifacts were observed.

**Features Discussion:** No features were observed.

**Terrestrial Faunal Remains Collected During Excavation:** No terrestrial faunal remains were collected individually during excavation.

**Sample Results:** No sample analysis was conducted.

**GPR Discussion:** A review of amplitude slice maps indicated no linear features that might indicated the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.5 mbs.

GPR depth profiles for T-228 identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.35 mbs. Anomalies are observed in the profile but not within the excavation boundaries. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-228 was excavated to 1.8 mbs and beneath the water table at 1.60 mbs. The stratigraphy of T-228 consisted of fill strata (Ia–Ie) to the base of excavation at 1.80 mbs. The stratigraphy conformed to the USDA soil survey designation of Fill land. No cultural materials were identified within T-228.

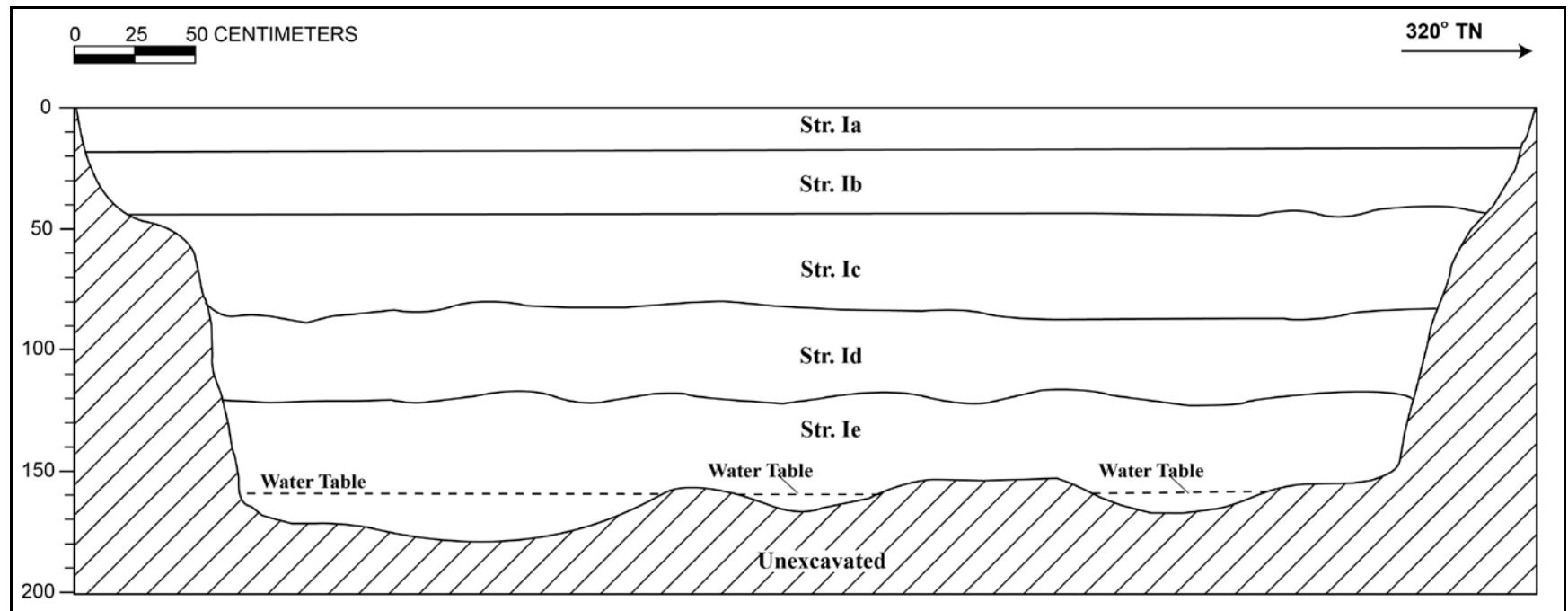




T-228 general location (view to northwest)



T-228 southwest profile wall (view to west)



T-228 southwest wall profile

## T-228 Stratigraphy Descriptions

Stratum	Depth (cmbs)	Description
Ia	0–18	Asphalt
Ib	18–45	Fill; 5 YR 3/2 (dark reddish brown); very gravelly sandy loam; single-grain structure; weakly coherent consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; contains ceramic sherds; basalt gravel base course
Ic	45–90	Fill; 2.5 Y 6/1 (gray); extremely stony, cobbly, gravelly coarse sand; structureless, single-grain; dry, loose consistency; non-plastic; marine origin; clear, smooth lower boundary; contained metal fragments/slag; mostly boulders/cobbles/gravel of coral, piece of slate
Id	80–125	Fill; 2.5 Y 4/1 (dark gray) with common, very fine with mottles of 2.5 Y 6/3 (light yellowish brown); cobbly, gravelly, very fine sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; clear, smooth lower boundary; some small coral gravels/cobbles, fill layer; base of excavation cleaned off in this layer to see if pits present—none were; some charcoal flecks, small ceramic fragments, rusted metal were observed
Ie	120–180	Fill; 10 YR 2/1 (black); extremely stony gravelly coarse sand; structureless, single-grain; wet, non-sticky consistency; non-plastic; terrigenous origin; lower boundary not visible; heavily oxidized decomposed basalt with Tantalus volcanic cinder



## 4.16 Test Excavation 228A (T-228A)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6
<b>TMK #:</b>	2-1-027
<b>Elevation Above Sea Level:</b>	1.61 m
<b>UTM:</b>	618045.6968 mE, 2356018.978 mN
<b>Max Length/Width/Depth:</b>	6.75 m / 0.80 m / 1.40 mbs
<b>Orientation:</b>	314 / 134° TN
<b>Targeted Project Component:</b>	Utility Relocation
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 228A (T-228A) was located on Pohukaina Street, approximately 55 meters southeast of Pohukaina Street and Punchbowl Street intersection. T-228A was located 3.4 m southeast of a water line and 5.2 m northwest of a sewer line. T-228A was located on property owned by the City and County of Honolulu. T-228A was added to further investigate natural sand/land surfaces for the immediate area. This test excavation also investigated a utility relocation. The excavation surface was level with the surrounding land surface.

**Summary of Background Research and Land Use:** The land use for this region consisted of taro cultivation, salt production, and fish farming. Most of the LCAs in the vicinity were small awards with house lots, *lo'i*, and ponds. On S. E. Bishop's 1884 map of Honolulu, T-228A was located within the *'ili* of Ka'ākaukukui in the LCA 7712:6. LCA 7712:6 was awarded to Victoria Kamāmalu, the sister of Kamehameha IV and Kamehameha V. The 1897 map of Honolulu by M. D. Monsarrat indicated T-228A was situated approximately 200 m southeast of harbors and infrastructure, and 150 m south of three ponds. The 1919 U.S. Army War Department map indicated major urban development in the areas surrounding T-228A. By 1953, T-228A was located in the present day location in Pohukaina Street, according to the 1953 topographic map by the U.S. Army Mapping Service.

Previous archaeology of the surrounding area includes several studies. In 1985, excavations conducted at the former location of the Honolulu Iron Works encountered five human burials in a parcel of land between Punchbowl Street and South Street and from Pohukaina Street to near Ala Moana Boulevard (Yent 1985). The exact location of the five burials within the study area was not recorded although the report notes the construction site as being at the intersection of Punchbowl Street and Pohukaina Street. The boundary of the study area was located within 90 m southwest of T-228A. During monitoring for the Judiciary Parking Garage, at the north corner of Pohukaina and South Streets approximately 120 m east of T-228A, concentrations of historic artifacts (mainly glass bottles) designated SIHP #50-80-14-1973 (Athens 1986). Subsequent analysis of the post-Contact artifact material determined that the most likely time frame for the manufacture and disposal of the historic artifacts was between 1880 and 1930 (Leidemann 1988). A 2011 survey identified four historic properties (SIHP #50-80-14-7124, -7189, -7190 and -7197), including burned historic debris, salt pan remnants, and a cultural layer containing one

late pre-Contact/early post-Contact fire pit features approximately 300 m northeast of T-228A (Pammer et al. 2011).

**Documentation Limitations:** T-228A was excavated to the coral shelf at a depth of 1.40 mbs. There were no factors that limited the documentation of T-228A.

**Stratigraphic Summary:** The stratigraphy of T-228A consisted of fill material overlying natural sediment. The observed strata included asphalt (Ia), very gravelly sandy loam (Ib), very gravelly sandy loam (Ic), loamy sand (Id), very fine to medium sand (Ie), medium to coarse loamy sand (If) loamy medium sand (Ig), natural sandy clay (IIa), and natural sandy clay (IIb). The stratigraphy generally conformed to the USDA Fill land soil designation.

**Artifacts Discussion:** No artifacts were observed.

**Features Discussion:** No features were observed.

**Terrestrial Faunal Remains Collected During Excavation:** Faunal remains were collected from Stratum If at 1.25 mbs. Faunal remains included large unidentified fish fragments. The faunal remains collected from Stratum If are considered to be food remains.

**Sample Results:** No sample analysis was conducted.

**GPR Discussion:** A review of amplitude slice maps indicated no linear features that might indicated the presence of utilities. Reflectivity is relatively uniform throughout the grid. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.25 mbs and increases again around 0.75 mbs.

GPR depth profiles for Excavation 228A identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.15 mbs and again at 0.5 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 1.3 mbs.

**Summary:** T-228A was excavated to the coral shelf at a depth of 1.40 mbs. The stratigraphy of T-228A consisted of imported fill material (Ia–If), overlying a locally procured fill event (Ig), which directly overlaid two thin natural marine deposits (IIa–IIb). The stratigraphy generally conformed to the USDA Fill land soil designation and historical background research which indicated heavy industrial and urban development, over filled in natural marshlands. No archaeologically cultural resources were identified.

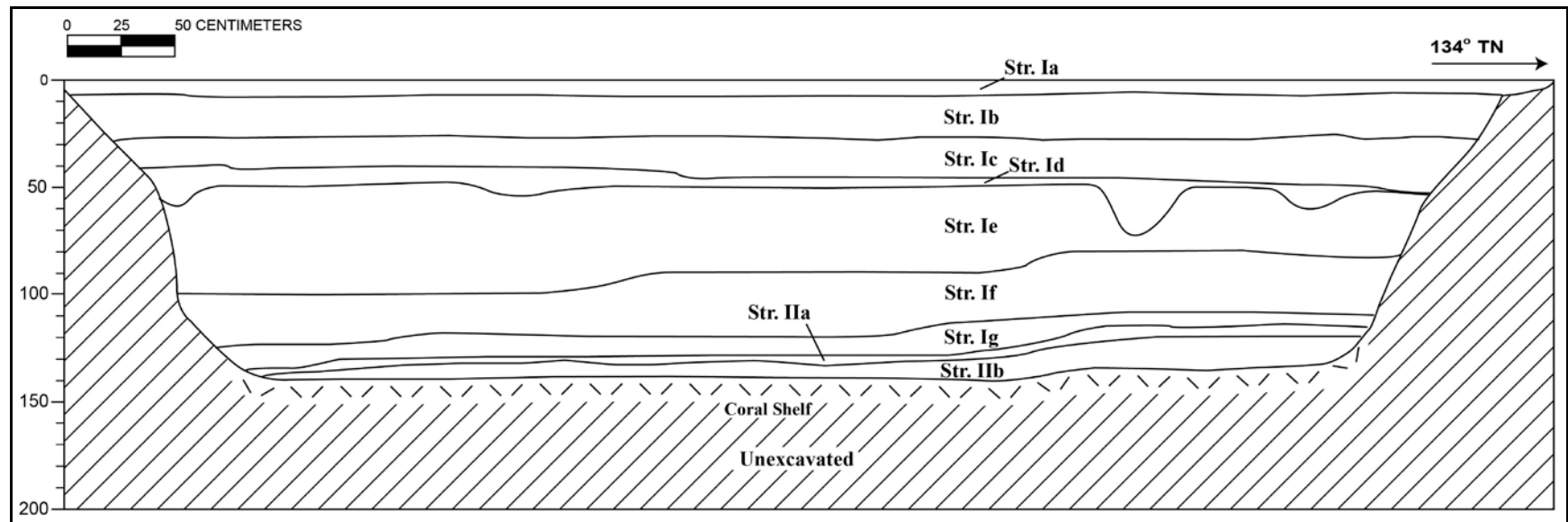


T-228A general location (view to south)



T-228A northeast profile wall (view to east)





T-228A northeast wall profile

## T-228A Stratigraphy Description

Stratum	Depth (cmbs)	Description
Ia	0–8	Asphalt/concrete
Ib	8–29	Fill; very gravelly sandy loam; 10YR 3/2 (very dark grayish brown); single-grain structure; moist, very friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; base course, basalt gravel
Ic	29–54	Fill; very gravelly sandy loam; 7.5 YR 3/4 (dark brown); single-grain structure; moist, very friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; base course, basalt gravel
Id	40–52	Fill; loamy sand; 10 YR 5/2 (grayish brown); single-grain structure; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; imported sand
Ie	49–100	Fill; very fine to med. sand; 10 YR 7/3 (very pale brown); single-grain structure; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; mix of very fine/fine med to coarse sand
If	80–125	Fill; loamy sand, med to coarse; 10 YR 6/2 (light brownish gray); single-grain structure; moist, loose consistency; non-plastic; marine origin; diffuse, smooth lower boundary; imported fill with striations
Ig	107–135	Fill; loamy medium sand; 10 YR 6/2 (light brownish gray); platy structure; moist, very friable consistency; slightly plastic; marine origin; diffuse, smoother lower boundary; faunal bone fragment; imported fill above natural sediments
IIa	115–139	Natural; sandy clay; Gley 2 5/5 BG (greenish clay); blocky structure; wet, slightly sticky consistency; plastic; marine origin; abrupt, smooth lower boundary; naturally deposited sandy clay
IIb	120–140	Natural; sandy clay; Gley 2 3/5 BG (very dark greenish gray); blocky structure; wet, slightly sticky consistency; marine origin; lower boundary not visible; two fragments of wood; naturally deposited sandy clay

## 4.17 Test Excavation 229 (T-229)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6
<b>TMK#:</b>	2-1-030
<b>Elevation Above Sea Level:</b>	1.51 m
<b>UTM:</b>	618187.8925mE, 2355851.085mN
<b>Max Length/Width/Depth:</b>	6.1m / 0.8m / 1.48 mbs
<b>Orientation:</b>	144 / 334° TN
<b>Targeted Project Component:</b>	Utility Relocation
<b>USDA Soil Designation:</b>	Ewa silty clay loam (EmA)

**Setting:** Test Excavation 229 (T-229) was located on Pohukaina Street, east of Ala Moana Boulevard and between South Street and Keawe Street. Several utilities were located near T-229 including a storm drain 1.5 m to the northeast, a sewer line 2.14 m to the north, and a water line 6.5 m to the northwest. The test excavation was level with the surrounding road surface and was on city-owned property.

**Summary of Background Research and Land Use:** The land use for this region consisted of taro cultivation, salt production, and fish farming. Most of the LCAs in the vicinity were small awards with house lots, *lo'i*, and ponds. On S. E. Bishop's 1884 map of Honolulu, T-229 was located within the *'ili* of Ka'ākaukukui in the LCA 7712:6. LCA 7712:6 was awarded to Victoria Kamāmalu, the sister of Kamehameha IV and Kamehameha V. The 1919 U.S. Army War Department map indicated major urban development in the areas surrounding T-229. By 1953, T-229 was located in the present day location on Pohukaina Street, according to the 1953 topographic map by the U.S. Army Mapping Service.

Previous archaeology of the surrounding area includes several studies. In 1985, excavations conducted at the former location of the Honolulu Iron Works encountered five human burials in a parcel of land between Punchbowl Street and South Street and from Pohukaina Street to near Ala Moana Boulevard (Yent 1985). The exact location of the five burials within the study area was not recorded although the report notes the construction site as being at the intersection of Punchbowl Street and Pohukaina Street. The boundary of the study area was located within 140 m southwest of T-229. During monitoring for the Judiciary Parking Garage, at the north corner of Pohukaina and South Streets approximately 70 m northwest of T-229, concentrations of historic artifacts (mainly glass bottles) designated SIHP #50-80-14-1973 (Athens 1986). Subsequent analysis of the post-Contact artifact material determined that the most likely time frame for the manufacture and disposal of the historic artifacts was between 1880 and 1930 (Leidemann 1988). A 2011 survey identified four historic properties (SIHP #50-80-14-7124, -7189, -7190 and -7197), including burned historic debris, salt pan remnants, and a cultural layer containing one late pre-Contact/early post-Contact fire pit features (Pammer et al. 2011) approximately 11 m north of T-229.



**Documentation Limitations:** T-229 was excavated to the coral shelf and water table at 1.48 mbs. There were no factors that limited the documentation of T-229.

**Stratigraphic Summary:** The stratigraphy of T-229 consisted of fill strata to the base of excavation at the coral shelf. Observed strata included asphalt (Ia), basalt gravel base course (Ib), gravelly sandy loam (Ic), burned fill (Id), sandy clay loam fill (Ie), sandy silt with cobble inclusions (If), sandy clay (Ig), sandy clay fill (Ih), natural sandy clay (II), and naturally decomposing coral shelf (III). The sediment deposition was composed of eight imported fill events, overlaying two natural marine deposits, which was directly above a naturally decomposing coral shelf. The stratigraphy does not conform to the USDA soil survey designation of Ewa silty clay loam, but instead was more consistent with sediments seen in the Fill land soil designation. Stratum Id was considered to be a component of SIHP #50-80-14-7189, a subsurface deposit from a historic open air burned trash layer.

**Artifacts Discussion:** Artifacts observed consisted of red clay brick (strata Ic, Ie, and If), broken glass shards (Ic and If), broken ceramic sherds (Ic and If), and two metal pipe segments (0.30 m long and 0.03 m diameter) which came from northwest end of the northeast excavation wall (Ih).

**Features Discussion:** No features were observed.

**Terrestrial Faunal Remains Collected During Excavation:** Fish remains were collected from Stratum III at 1.19–1.31 mbs.

**Sample Results:** One bulk sample was collected from Stratum III between 1.19 and 1.31 mbs (2.5 L). The bulk sample was wet-screened and identified charcoal (0.7 g), naturally deposited shell of Melampidae *Melampus castaneus* (3.2 g), Mytilidae *Brachiodontes crebristriatus* (2.7 g), crustacean (0.2 g), *Neritia picea* (0.8 g), Trochidae *Trochus sp.* (0.8 g), Nassariidae (0.8 g), Naticidae *Nattica sp.* (0.5 g), and gastropods (0.3 g), and fish scale (0.1 g). The results of sample analysis indicated that Stratum III contains a very sparse amount of organic and potential cultural content.

**GPR Discussion:** A review of amplitude slice maps indicated no linear features that might indicated the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.5 mbs.

GPR depth profiles for Excavation 229 identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.25 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-229 was excavated to the coral shelf at 1.48 mbs. The sediment deposition was composed of eight imported fill events, overlaying two natural marine deposits, which was directly above a naturally decomposing coral shelf. The stratigraphy does not conform to the USDA soil survey designation of Ewa silty clay loam, but instead was more consistent with sediments seen in the Fill land soil designation. The natural marine deposits and coral shelf are consistent with the historical background research, which indicated heavy industrial and urban development over filled in natural marshlands. The results of sample analysis indicated that Stratum III contains a very sparse amount of organic and potential cultural content. Stratum Id

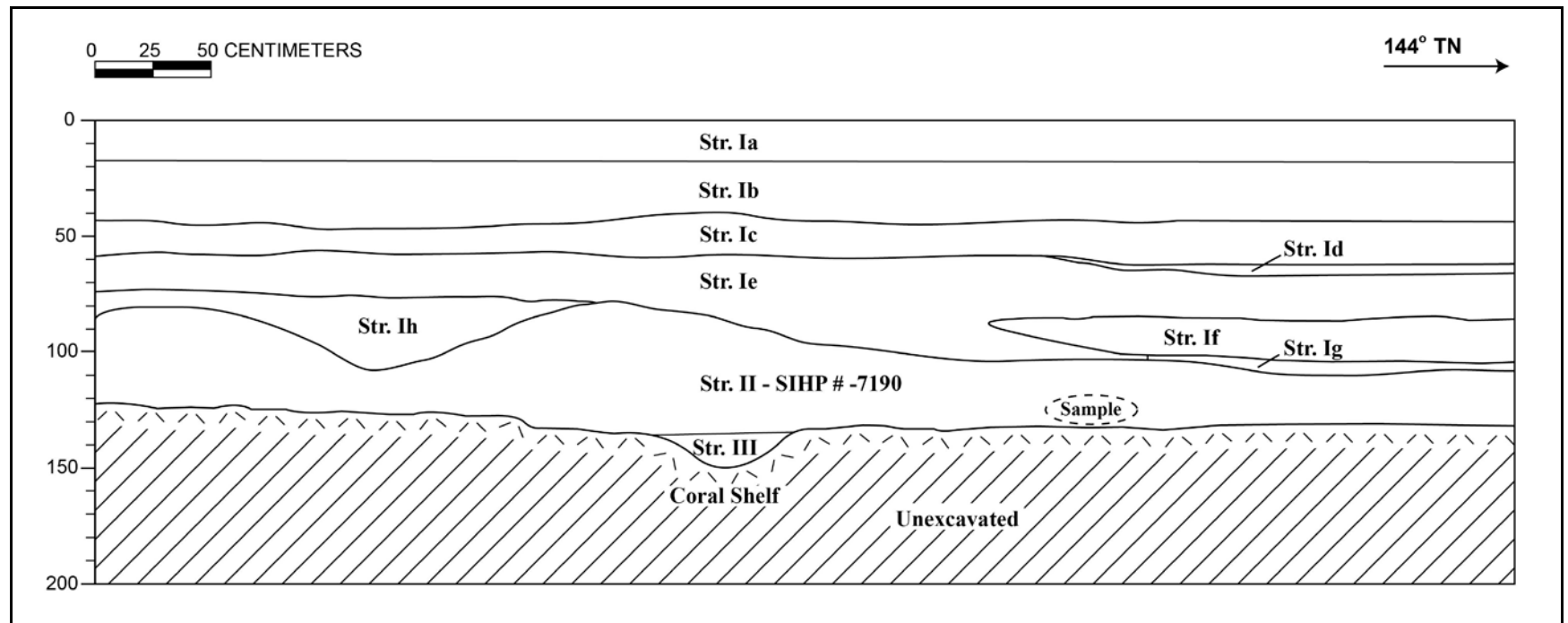
was considered to be a component of SIHP #50-80-14-7189, a subsurface deposit from a historic open air burned trash layer. The undulating upper boundary of Stratum II was considered to be culturally-modified and was designated as a component of SIHP #50-80-14-7190 (see Volume I).



T-229 general location (view to northwest)



T-229 northeast profile wall (view to east)



T-229 northeast wall profile



## T-229 Stratigraphic Description

<b>Stratum</b>	<b>Depth (cmbs)</b>	<b>Description</b>
Ia	0–17	Asphalt
Ib	17–47	Fill; 10 YR 4/2 (dark grayish brown); extremely gravelly loam; structureless, single-grain; moist, loose consistency; non-plastic, terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	40–63	Fill; 10 YR 3/1 (very dark gray); gravelly sandy loam; structureless, single-grain; moist, very friable consistency; non-plastic; mixed origin; clear, smooth lower boundary; contained charcoal, glass and ceramic fragments, red brick; gravel and cobble inclusions, consisted of coral and basalt
Id	63–68	Fill; 10 YR 2/1 (black); silty sandy loam, structureless, single-grain; moist, very friable consistency; non-plastic; terrigenous origin; abrupt, broken/discontinuous lower boundary; layer with similar texture to trash layer observed in T-232
Ie	60–104	Fill; 10 YR 3/3 (dark brown); sandy clay loam; weak, fine, blocky structure; friable consistency; slightly plastic; mixed origin; clear, wavy lower boundary; contained red brick; contained small coral boulders, cobbles, and gravel
If	85–105	Fill; 10 YR 5/6 (yellowish brown) with common, small mottles 10 YR 3/3 (dark brown); extremely cobbly stony sandy silt; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; contained coral cobbles and small boulders, red brick, glass and ceramic fragments
Ig	100–110	Fill; GLEY 1 3/5 GY (very dark greenish gray); sandy clay; massive structure; slightly sticky consistency; plastic; terrigenous origin; clear lower boundary; contained charcoal/incinerated inclusions; interface with incinerated fill layers with natural gley clay
Ih	73–107	Fill; 2.5 Y 4/3 (olive brown) with common, very coarse mottles of 7.5 YR 8/2 (pinkish white), few, mottles of GLEY 1 3/2 (very dark grayish green clay), and few mottles of 5 YR 4/6 (yellowish red); clay loam sandy clay; moderate, medium, blocky structure; wet, slightly stick consistency; plastic; mixed origin; abrupt lower boundary; contained wood, two pieces of metal pipe; fill surrounding old pipe containing coral cobbles and boulder, and burn wood; GPR read-out showed old excavation, likely for pipe
II	78–135	Natural; 2.5 Y 6/2 (light grayish brown) with mottles of GLEY 1 6/5 GY (greenish gray); sandy clay; structureless, massive; moist, firm consistency; plastic; marine origin; clear, broken/discontinuous lower boundary; possible sand berm, natural layer overlying coral shelf with organic (roots) inclusions
III	125–148	Natural, C-horizon; 2.5 Y 6/2 (light grayish brown); decomposing coral shelf; structureless, massive; indurated consistency; non-plastic; marine origin; lower boundary not visible; coral shelf level

## 4.18 Test Excavation 230 (T-230)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6
<b>TMK #:</b>	2-1-030
<b>Elevation Above Sea Level:</b>	1.56 m
<b>UTM:</b>	618261.1544mE, 2355761.85mN
<b>Max Length/Width/Depth:</b>	6 m / 0.8 m / 1.55 mbs
<b>Orientation:</b>	144 / 324° TN
<b>Targeted Project Component:</b>	Utility Relocation
<b>USDA Soil Designation:</b>	Fill land (FL) and Ewa silty clay loam (EmA)

**Setting:** Test Excavation 230 (T-230) was located on the southwest side of Pohukaina Street near the Keawe Street intersection. T-230 was located on public property owned by City and County of Honolulu near the historic Mother Waldron Park. Utilities near T-230 included a drain line 1.3 m to the northeast, and a sewer line 2.7 m to the southwest. The excavation surface was level with the surrounding surface.

**Summary of Background Research and Land Use:** The land use for this region consisted of taro cultivation, salt production, and fish farming. Most of the LCAs in the vicinity were small awards with house lots, *lo'i*, and ponds. On S. E. Bishop's 1884 map of Honolulu, T-230 was located within the *'ili* of Ka'ākaukukui in the LCA 7712:6. LCA 7712:6 was awarded to Victoria Kamāmalu, the sister of Kamehameha IV and Kamehameha V. Baldwin's 1883 map of Honolulu placed T-230 330 m northeast of the former shoreline. T-230 was within a former marshlands across the Kaka'ako coastal zone, according to S.E. Bishop's 1884 map of Honolulu. W. A. Wall's 1887 map of Honolulu indicated that T-230 was still within an undeveloped area with sparse urban development to the north. M. D. Monsarrat's 1897 map of Honolulu showed a changing landscape, with increased urban development and street grids to the north. By 1919 the coastal marshlands were filled and replaced with industrial structures and urban development, according to the U.S. Army War Department map of 1919. Urban development continued through the 1950s with major shoreline extension started in 1933, according to the U.S. Army War Department maps of 1933 and 1943. By 1953, T-230 was within a heavily urbanized area adjacent to Mother Waldron Park, according to the 1953 topographic map by the U.S. Army Mapping Service.

Several archaeological studies had been performed in the vicinity of T-230. Historic burned trash layers (SIHP #50-80-14-07189) and salt pans (SIHP #50-809-14-07190) were identified approximately 41.0 m west of T-230 (Pammer et al. 2011). A post-Contact subsurface deposit (SIHP #50-80-14-01388) was identified approximately 20 m northwest of T-230 (Hammatt 1998). Eleven burials (SIHP #50-80-14-05820) around Mother Waldron Park were identified during archaeological monitoring of a study area located approximately 200.0 m north of T-230 (Douglas 1991, Winieski and Hammatt 2000). T-230 was located within a known subsurface historic burned garbage deposit (SIHP # -07189) (Pammer et al. 2011).

**Documentation Limitations:** T-230 was excavated to the coral shelf at 1.55 mbs.

**Stratigraphic Summary:** Stratigraphy consisted of fill layers overlying natural sediments. The observed stratigraphy included asphalt (Ia), extremely gravelly loam base course (Ib), crushed coral fill (Ic), clay, hydraulic fill (Id), gravelly sandy loam fill (Ie), natural marsh/wetlands clay (II), natural marine sand (III), and the decomposing coral shelf (IV). T-230 was located on the USDA soil survey boundary between Fill land (FL) and Ewa silty clay loam (EmA). The stratigraphy generally conformed to the USDA soil survey designation of Fill land.

**Artifacts Discussion:** No artifacts were collected.

**Features Discussion:** No features were observed.

**Terrestrial Faunal Remains Collected During Excavation:** Faunal remains were collected from Stratum Ie. Faunal remains collected included a single bovine bone. The faunal remains collected were considered to be food remnants.

**Sample Results:** A bulk sediment sample was collected from Stratum II at 1.2-1.4 mbs (4 L). The bulk sample was wet-screened and contained naturally-deposited marine shell. The results of sample analysis support the identification of Stratum II as naturally-deposited sediment.

**GPR Discussion:** A review of amplitude slice maps indicated no linear features that might indicated the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.25 mbs.

GPR depth profiles for Excavation 230 identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.1 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-230 was excavated to the coral shelf at 1.55 mbs. Stratigraphy consisted of fill layers (Ia-Ie) overlying natural sediments (II-IV). The stratigraphy generally conformed to the USDA soil survey designation of Fill land and not to Ewa silty clay loam. The results of sample analysis support the identification of Stratum II as naturally-deposited sediment. The peat lenses observed within Stratum II were considered to be evidence of cultural modification. Stratum II within T-230 and has been designated as a component of SIHP #50-80-14-7190.

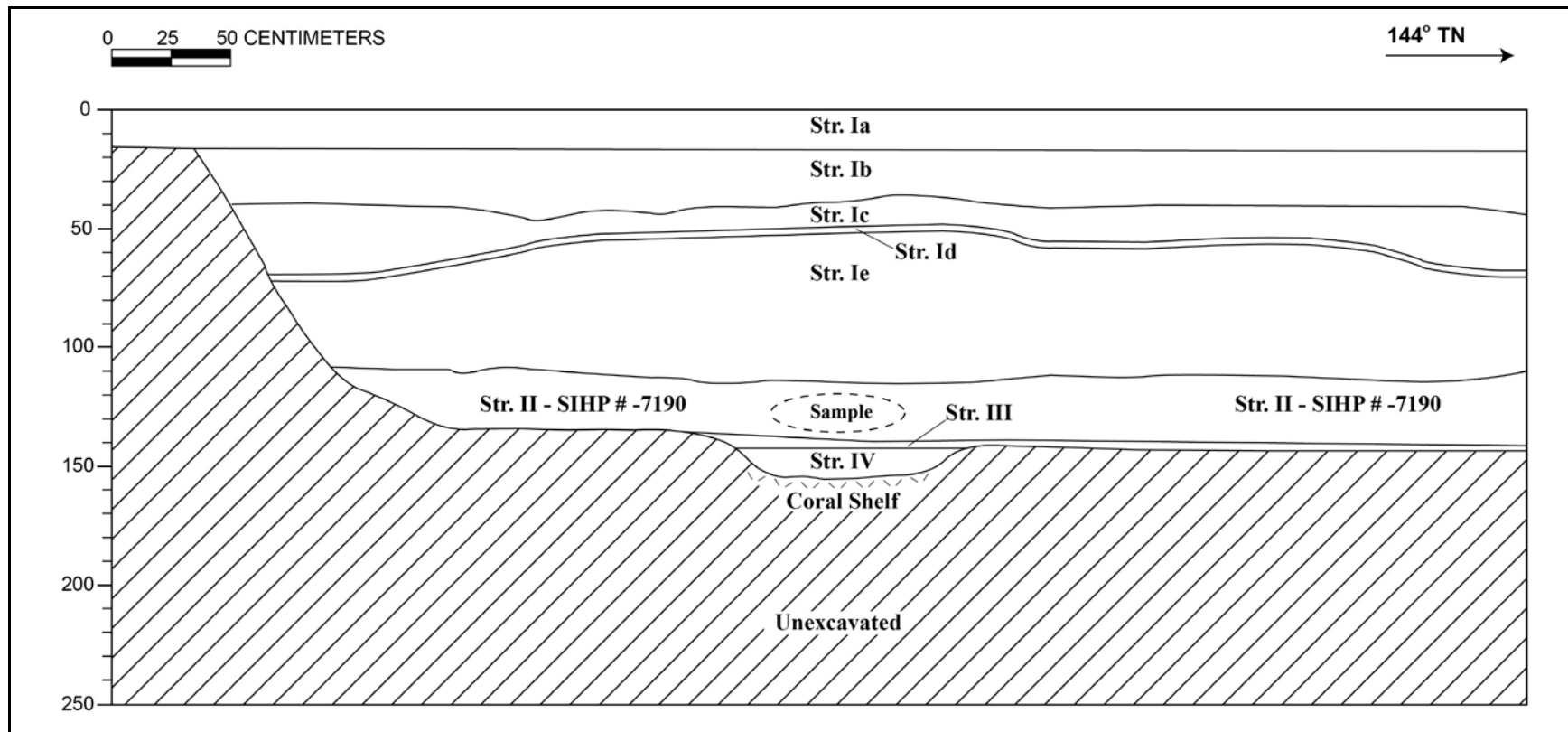


T-230 general location (view to northwest)



T-230 northeast profile wall





T-230 northeast wall profile

## T-230 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0–16	Asphalt
Ib	16–46	Fill; 10 YR 5/1 (gray); extremely gravelly loam; structureless, single-grain; moist, loose consistency; non-plastic, terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	37–70	Fill; 10 YR 6/2 (light brownish gray), extremely gravelly sand; structureless; moist, loose consistence; non-plastic; marine origin; abrupt smooth lower boundary; crushed coral fill
Id	47–70	Fill; 10 YR 7/2 (light gray); clay; structureless, massive; moist, friable consistency; plastic; marine origin; abrupt smooth lower boundary; hydraulic fill and clay lens
Ie	50–115	Fill; 10 YR 5/2 (grayish brown); extremely gravelly sand; structureless, single-grain; moist, loose consistency; slightly plastic; mixed origin; abrupt lower boundary; crushed coral basalt fill with faunal remains
II	110–137	Natural; GLEY 1 6/N (gray); silty clay; weak, very fine, blocky structure; moist, friable consistency; plastic; mixed origin; clear lower boundary; common, fine roots; low energy marshland sediments, contained lenses of peat
III	135–145	Natural; 10 YR 7/2 (light gray) sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; clear smooth lower boundary
IV	145–155	Natural; decomposing coral shelf

## 4.19 Test Excavation 231 (T-231)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6
<b>TMK #:</b>	2-1-051 [Plat]
<b>Elevation Above Sea Level:</b>	1.84 m
<b>UTM:</b>	618349.5526mE, 2355646.177mN
<b>Max Length/Width/Depth:</b>	6 m / 0.8 m / 1.32 mbs
<b>Orientation:</b>	316 / 136° TN
<b>Targeted Project Component:</b>	Utility Relocation (electric manhole)
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 231 (T-231) was located within southwest side of Pohukaina Street near the Cooke Street intersection. T-231 was located on public property owned by the City and County of Honolulu near the southern side of the historic Mother Waldron Park. Utilities located within the proximity of T-231 included a water line 4 m northeast and a Hawaiian Telcom line 0.9 m southwest. The excavation surface was level with the surrounding surface.

**Summary of Background Research and Land Use:** The land use for this region consisted of taro cultivation, salt production, and fish farming. Most of the LCAs in the vicinity were small awards with house lots, *lo'i*, and ponds. On S. E. Bishop's 1884 map of Honolulu, T-231 was located within the *'ili* of Ka'ākaukukui in the LCA 7712:6. LCA 7712:6 was awarded to Victoria Kamāmalu, the sister of Kamehameha IV and Kamehameha V. Baldwin's 1883 map of Honolulu placed T-231 320 m northeast of the former shoreline. T-231 was within a former marshlands across the Kaka'ako coastal zone, according to S.E. Bishop's 1884 map of Honolulu. W. A. Wall's 1887 map of Honolulu indicated that T-231 was still within an undeveloped area with sparse urban development to the northeast. M. D. Monsarrat's 1897 map of Honolulu showed a changing landscape, with increased urban development and street grids to the northeast. By 1919 the coastal marshlands were filled and replaced with industrial structures and urban development, according to the U.S. Army War Department map of 1919. Urban development continued through the 1950s with major shoreline extension started in 1933, according to the U.S. Army War Department maps of 1933 and 1943. By 1953 T-231 was within a heavily urbanized area adjacent to Mother Waldron Park, according to the 1953 topographic map by the U.S. Army Mapping Service.

Several archaeological studies had been performed in the vicinity of T-231. Historic burned trash layers (SIHP #50-80-14-07189) and salt pans (SIHP #50-809-14-07190) were identified approximately 190.0 m west of T-231 (Pammer et al. 2011). A post-Contact subsurface deposit (SIHP #50-80-14-01388) was identified approximately 15.0 m west of T-231 (Hammatt 1998). Eleven burials (SIHP #50-80-14-05820) around Mother Waldron Park were identified during archaeological monitoring of a study area located approximately 130.0 m north of T-231 (Douglas 1991, Winieski and Hammatt 2000). T-231 was located within a known subsurface historic burned garbage deposit (SIHP-07189) (Pammer et al. 2011).

**Documentation Limitations:** T-231 was excavated to a depth of 1.32 mbs due to the presence of a 12-inch vitrified clay pipe encountered at 1.3 mbs that extended the length of the excavation. Excavation was unable to proceed below the utility.

**Stratigraphic Summary:** The stratigraphy of T-231 consisted of fill material to the base of excavation. The observed stratigraphy included asphalt (Ia), gravel base course (Ib), crushed coral fill (Ic), silty sand fill (Id), and sand fill (Ie). The stratigraphy conformed to the USDA soil survey designation of Fill land.

**Artifacts Discussion:** No artifacts were observed.

**Features Discussion:** No features were observed.

**Terrestrial Faunal Remains Collected During Excavation:** No terrestrial faunal remains were collected individually during excavation.

**Sample Results:** No sample analysis was performed.

**GPR Discussion:** A review of amplitude slice maps indicated a linear feature which could correspond to the sewer line that was encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.25 mbs.

GPR depth profiles for Excavation 231 identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.2mbs and again around 0.7 mbs. An anomaly is observed in the profile and seems to correspond to the sewer line encountered during excavation. The maximum depth of clean signal return was approximately 1.5 mbs.

**Summary:** T-231 was excavated to a depth of 1.32 mbs. A 12-inch vitrified clay pipe at 1.3 mbs prevented further excavation. The stratigraphy conformed to the USDA soil survey designation of Fill land. No natural sediments were observed. No cultural materials were identified.

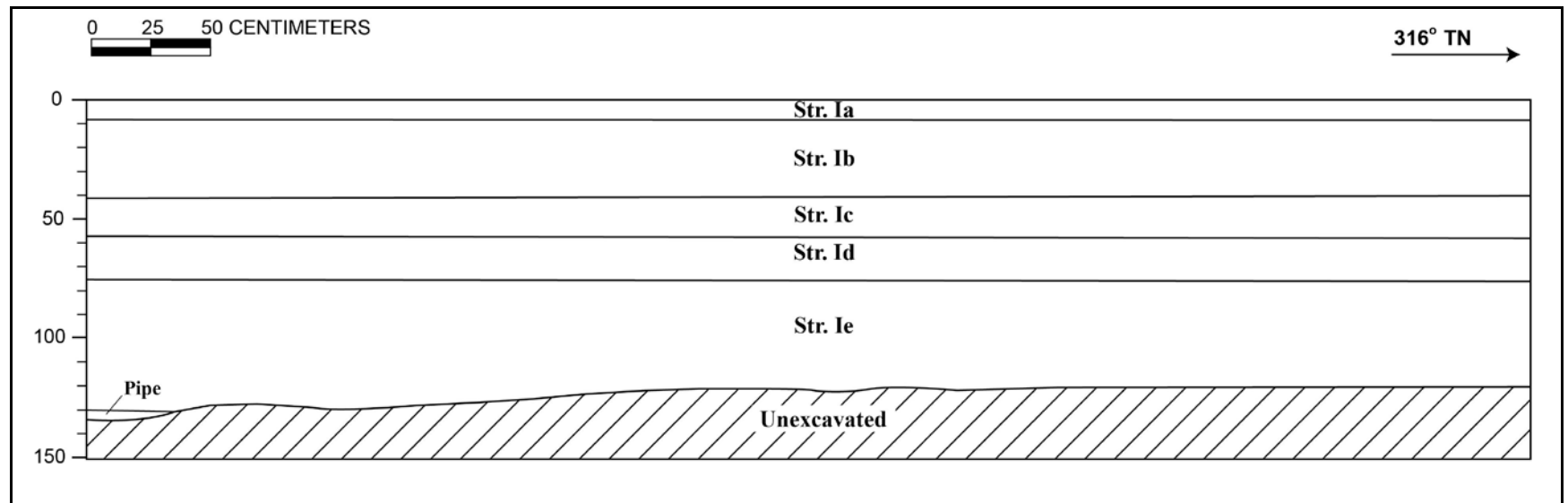




T-231 general location (view to northwest)



T-231 southwest profile wall (view to west)



T-231 southwest wall profile

## T-231 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0–9	Asphalt
Ib	9–43	Fill; 10 YR 5/1; (gray); extremely gravelly loam; structureless, single-grain; moist, loose consistency; non-plastic, terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	43–58	Fill; 10 YR 8/3; (very pale brown) extremely gravelly sand; structureless, single-grain; moist, loose consistency; non-plastic; diffuse, smooth lower boundary; contained chunks of buried asphalt slab, old broken pipe pieces; imported sand fill with construction and modern debris
Id	58–76	Fill; 10 YR 8/2 (very pale brown); silty sand; structureless, massive; moist, friable consistency; slightly plastic; mixed origin; clear, smooth lower boundary; imported hydraulic fill—thin bands (3-4cm) of 10 YR 7/2 hydraulic fill clay
Ie	76–132	Fill; 10 YR 7/4 (very pale brown); sand; structureless, single-grain; moist, very friable consistency; non-plastic; marine origin; contained asphalt chunks, 12" VC pipe; imported sand fill with asphalt chunks, gravel; at 130 cmbs 12" VC pipe

## 4.20 Test Excavation 231A (T-231A)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6
<b>TMK #:</b>	2-1-051 [Plat]
<b>Elevation Above Sea Level:</b>	1.85 m
<b>UTM:</b>	618355.9617mE, 2355651.928mN
<b>Max Length/Width/Depth:</b>	6.71 m / 0.71 m / 1.85 mbs
<b>Orientation:</b>	128 / 308° TN
<b>Targeted Project Component:</b>	Utility Relocation
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 231A (T-231A) was located within Pohukaina Street near the Cooke Street intersection. T-231A was located on public property owned by the City and County of Honolulu near the southern side of the historic Mother Waldron Park. Utilities near T-231A included an electric line 2.7 m northeast, an electric line 3.0 m west, and a sewer line 4.2 m west. T-231A was added to further investigate the vicinity of T-231, which encountered a utility line and could not be completely excavated. This test excavation also investigated a utility relocation. The excavation surface was level with the surrounding surface.

**Summary of Background Research and Land Use:** The land use for this region consisted of taro cultivation, salt production, and fish farming. Most of the LCAs in the vicinity were small awards with house lots, *lo'i*, and ponds. According to S. E. Bishop's 1884 map of Honolulu, T-231A was located within the *'ili* of Ka'ākaukukui in the LCA 7712:6. LCA 7712:6 was awarded to Victoria Kamāmalu, the sister of Kamehameha IV and Kamehameha V. Baldwin's 1883 map of Honolulu placed T-231A 330 m northeast of the former shoreline. T-231A was within a former marshlands across the Kaka'ako coastal zone, according to S.E. Bishop's 1884 map of Honolulu. W. A. Wall's 1887 map of Honolulu indicated that T-231A was still within an undeveloped area with sparse urban development to the northeast. M. D. Monsarrat's 1897 map of Honolulu showed a changing landscape, with increased urban development and street grids to the northeast. By 1919 the coastal marshlands were filled and replaced with industrial structures and urban development, according to the U.S. Army War Department map of 1919. Urban development continued through the 1950s with major shoreline extension started in 1933, according to the U.S. Army War Department maps of 1933 and 1943. By 1953 T-231A was within a heavily urbanized area adjacent to Mother Waldron Park, according to the 1953 topographic map by the U.S. Army Mapping Service.

Several archaeological studies had been performed in the vicinity of T-231A. Historic burned trash layers (SIHP #50-80-14-7189) and salt pans (SIHP #50-80-14-7190) were identified approximately 200.0 m west of T-231A (Pammer et al. 2011). A post-Contact subsurface deposit (SIHP #50-80-14-1388) was identified approximately 5.0 m west of T-231A (Hammatt 1998). Eleven burials (SIHP #50-80-14-5820) around Mother Waldron Park were identified during archaeological monitoring of a study area located approximately 120.0 m north of T-231A



(Douglas 1991, Winieski and Hammatt 2000). T-231A was located within a known subsurface historic burned garbage deposit (SIHP-7189) (Pammer et al. 2011).

**Documentation Limitations:** T-231A was excavated to a depth of 1.85 mbs, and reached the water table at 1.83 mbs. A utility was encountered at 0.53 mbs in the north wall and extended the length of T-231A. Excavation proceeded with a smaller backhoe bucket.

**Stratigraphic Summary:** The stratigraphy consisted of fill material overlying natural layers. The observed stratigraphy included asphalt (Ia), very gravelly silty sand fill (Ib), very gravelly sandy loam fill (Ic), silt loam fill (Id), gravelly sandy loam (Ie), sandy loam fill (If), burned trash layer (Ig), silty clay loam fill (Ih), natural silty sand (II), very gravelly to cobbly loamy sand (III), and the decomposing coral shelf (IV). The stratigraphy conformed to the USDA soil survey designation of Fill land. Stratum Ig was considered to be a component of SIHP #50-80-14-7189, a subsurface deposit from a historic open air burned trash layer.

**Artifacts Discussion:** A total of 33 artifacts (Acc. #231A-A-1 to A-22, see following table and photographs) were collected from Stratum Ig between 0.9–1.32 mbs, consisting of 11 ceramic fragments from six vessels, nine glass fragments from nine bottles and 13 miscellaneous artifact fragments. One ceramic plate made in England (Acc. #231A-A-1) was dated to 1873–1907; the majority of remaining ceramics reflect Asian motifs. The bottles are all mold blown, dating to the 1860s to 1890s; one bottle (Acc. #231A-A-14) denotes a former downtown drugstore, Hollister and Co. One miscellaneous artifact, a box lid (Acc. #231A-A-16), possibly for sealing paste, also has an Asian design. Artifacts collected from T-231A indicated that the stratum dates to the mid-to late nineteenth century.

**Features Discussion:** No features were observed.

**Terrestrial Faunal Remains Collected During Excavation:** Several faunal fragments (*Bos Taurus*, *Sus scrofa*) were collected from Stratum Ib at approximately 0.54 mbs (see Faunal Analysis Table located at the end of Section 3.20). The faunal remains collected were considered to be food remains.

**Sample Results:** Bulk sediment samples were collected from Stratum Ig at 0.9–1.1 mbs (15 L), Stratum III at 1.5–1.68 mbs (2 L), and Stratum IV at 1.68–1.85 mbs (2 L). All of the bulk sediment samples were wet-screened. The bulk sample from Stratum Ig contained charcoal (0.6 g), naturally-occurring, water-rounded marine shell (1.7 g), unidentified medium mammal bone fragments (6.4 g), an unidentified small mammal bone (0.1 g), unidentified fish bone (0.2 g), and numerous historic artifacts. The historic artifacts from the Stratum Ig sample included rusted metal fragments (91.6 g), bottle glass fragments (31.3 g), ceramic fragments (10.9 g), a porcelain fragment (0.1 g), coal or slag pieces (7.1 g), a rusted .22-caliber copper shell casing (0.7 g), and small metal nails (0.2 g). The bulk samples from Stratum III and Stratum IV contained only naturally-occurring, water-rounded marine shell. A single sample from Stratum Ib was collected at 0.54 mbs and contained a water-rounded chert manuport (7.4 g).

**GPR Discussion:** A review of amplitude slice maps indicated no linear features, although two utilities were encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.25 mbs

GPR depth profiles for T-231A identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.15 mbs and again around 0.6 mbs. An anomaly is observed in the profile but was not observed during excavation and does not correspond to the utilities encountered. The maximum depth of clean signal return was approximately 0.8 mbs.

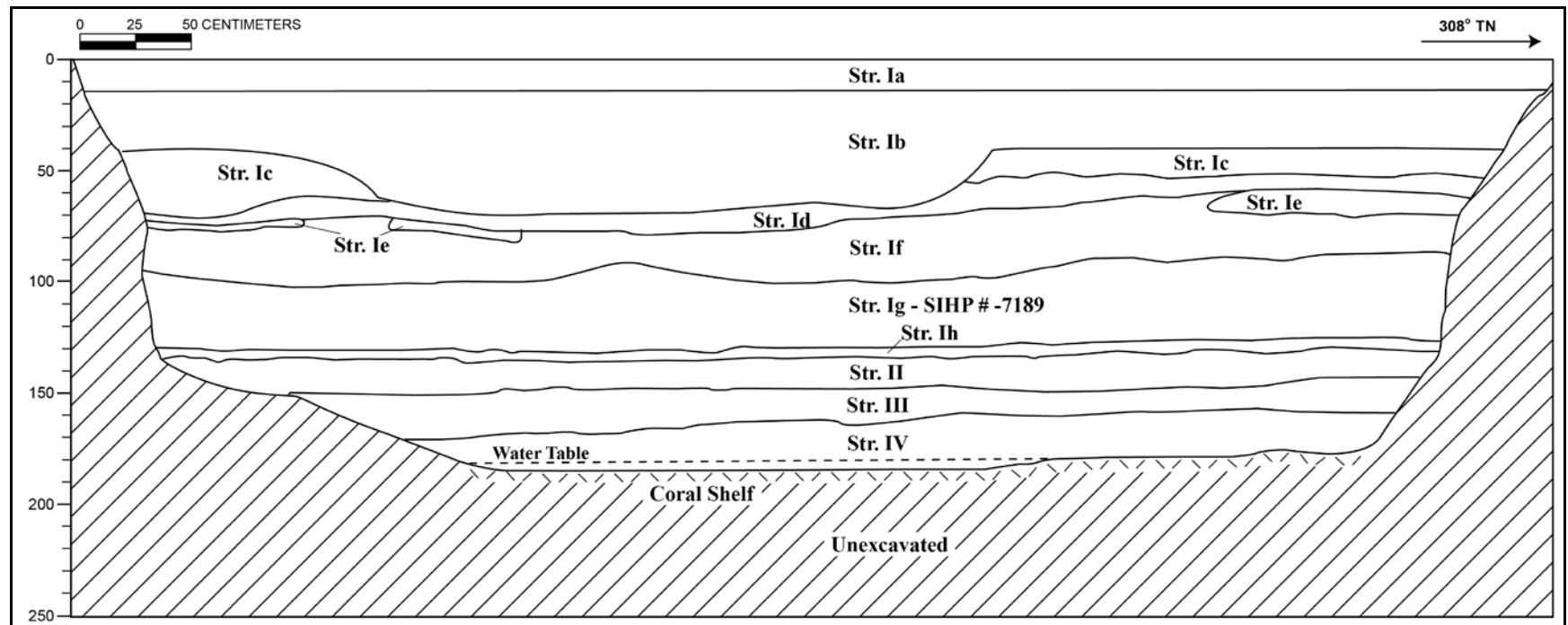
**Summary:** T-231A was excavated to a depth of 1.85 mbs, and reached the water table at 1.83 mbs. Stratigraphy consisted of fill material (Ia–Ih) overlying natural layers (II–IV). The stratigraphy conformed to the USDA soil survey designation of Fill land. The artifacts collected from Stratum Ig were consistent with historic fill deposits. The faunal remains collected were considered to be food remains. Stratum Ig was considered to be a component of SIHP #50-80-14-7189, a subsurface deposit from a historic open air burned trash layer (see Volume I for further discussion of all historic properties).



T-231A general location, view to southeast



T-231A southwest profile wall, view to south



T-231A southwest wall profile



## T-231A Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0–15	Asphalt
Ib	15–70	Fill; 10 YR 5/2 (grayish brown); extremely gravelly silty loam; structureless, single-grain; moist, loose consistency; non-plastic, terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	42–72	Fill; 10 YR 8/2 (very pale brown); very gravelly sandy loam; structureless, single-grain; moist, friable consistency; non-plastic; mixed origin; very abrupt, smooth lower boundary; contained faunal fragments; crushed coral
Id	63–75	Fill; 10 YR 4/2 (dark grayish brown); silty loam; weak, very fine, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; contained faunal fragments
Ie	57–82	Fill; 10 YR 2/1 (black); gravelly sandy loam; weak, fine, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, broken/discontinuous lower boundary
If	61–103	Fill; 10 YR 3/2 (very dark grayish brown); sandy loam; weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary
Ig	91–132	Fill; 10 YR 2/1 (black); sandy clay loam; structureless, single-grain; moist, friable; mixed origin; clear, smooth lower boundary; contains glass bottles, cut bone, fabric, wood, shoe soles; burned trash layer; a component of SIHP #50-80-14-7189
Ih	132–136	Fill; 10 YR 2/1 (black); silty clay loam; structureless, massive; moist, friable to firm consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary
II	136–150	Natural; 10 YR 8/4 (very pale brown); silty sand; structureless, single-grain; moist, very friable consistency; non-plastic; marine origin; clear, smooth lower boundary
III	150–168	Natural; 2.5 Y 8/2 (pale yellow); very gravelly to cobbly loamy sand; structureless, single-grain; moist, friable to firm consistency; non-plastic; marine origin; clear, smooth lower boundary; decomposing coral shelf
IV	168–185	Natural; GLEY 1 7/5GY (light greenish gray); very gravelly loamy sand; structureless, single-grain; moist, firm consistency; non-plastic; mixed origin; decomposing coral shelf; lower boundary not visible

## T-231A Historic Artifact Analysis

Acc. #231A- A-	Provenience	Ceramic Vessel Type	Portion	No.	Paste; Decor.	Origin; Age	Comments
1	T-231A, St. Ig	Flatware, plate	Body	1	Earthenware, Refined (Ironstone)	England; 1873– 1907	Made by George Jones and Sons, England
2	T-231A, St. Ig	Dinnerware	Body	1	Porcelain		Fragment with broken handle end
3	T-231A, St. Ig	Unknown	Body	1	Earthenware, Coarse		Slightly curved, thus not from a flowerpot
4	T-231A, St. Ig	Dinnerware	Body	1	Porcelain; Painted underglaze		Blue band, possibly near rim
5	T-231A, St. Ig	Hollowware	Body to rim	1	Porcelain; Painted	Asian	Bamboo motif
6	T-231A, St. Ig	Crock	Body (5); rim (1)	6	Stoneware		
Acc. #231A- A-	Provenience	Glass Bottle Type	Portion	No.	Color	Origin; Age	Comments
7	T-231A, St. Ig	Bottle, spirits	Complete	1	Olive	1860– 1890	
8	T-231A, St. Ig	Bottle, spirits	Complete	1	Olive, Dark	1860– 1890	
9	T-231A, St. Ig	Bottle, spirits	Complete	1	Olive, Dark	1860– 1890	
10	T-231A, St. Ig	Bottle, spirits	Complete	1	Olive, Dark	1860– 1890	
11	T-231A, St. Ig	Bottle, medicine	Complete	1	Green, Light	1870s– 1920s	
12	T-231A, St. Ig	Bottle, spirits	Complete	1	Black	1860– 1890s	
13	T-231A, St. Ig	Bottle, spirits	Complete	1	Olive, Dark	1880s– 1920s	
14	T-231A, St. Ig	Bottle, soda	Base- neck	1	Green, light	American; 1893 ca.	Codd bottle; Hollister and Co., Honolulu
15	T-231A, St. Ig	Bottle, medicine	Complete	1	Clear	1870s– 1920s	Possible pill/aspirin bottle

Acc. #231A-A-	Provenience	Miscellaneous Type	Portion	No.	Material	Origin; Age	Description
16	T-231A, St. Ig	Box Lid	Complete	1	Soapstone	Asian	For sealing paste, possibly
17	T-231A, St. Ig	Ceramic item	Fragment	1	Earthenware		Possibly a lamp base
18	T-231A, St. Ig	Glass insulator	Fragment	2	Glass		
19	T-231A, St. Ig	Brick	Fragment	1			Red, machine- made
20	T-231A, St. Ig	Tubular item	Fragment	1	Charcoal		Charcoal for drawing?
21	T-231A, St. Ig	Window	Fragment	6	Glass		Window glass
22	T-231A, St. Ig	Chert	Fragment	1	Chert	Not from Hawai'i	Manuport



T-231A ceramic plate (Acc. #231A-A-1) interior, from Stratum Ig



T-231A ceramic plate T-231A ceramic plate (Acc. #231A-A-1) exterior, from Stratum Ig





T-231A ceramic fragments (Acc. #231A-A-2 to A-5), from Stratum Ig



T-231A stoneware fragments (Acc. #231A-A-6), from Stratum Ig



T-231a glass bottle (Acc. #231A-A-7 to A-10), from Stratum Ig



T-231a glass bottle (Acc. #231A-A-11), from Stratum Ig





T-231a glass bottle (Acc. #231A-A-12 to A-15), from Stratum Ig



T-231a miscellaneous artifacts (Acc. #231A-A-16 to A-18), from Stratum Ig

## T-231A Faunal Analysis

Acc. #	Stratum	Depth(cmbs)	Feature	Family/Class	Species	Element	Description	Modification
231A-F-1	Ic	54	-	Bovidae (cow)	<i>Bos taurus</i>	Left tibia (distal portion); Ribs; Rib; Spinous process	Fragments	Rib; Tibia butchered (cut with metal blade)
231A-F-2	Ic	54	-	Suidae (pig)	<i>Sus scrofa</i>	Ribs; Scapula	Fragments	None
231A-F-3	Ib	20	-	Bovidae (cow)	<i>Bos taurus</i>	Left humerus (distal portion); Diaphysis section	Fragments	Butchered (cut with metal blade)
231A-F-4	Ib	20	-	Canidae	<i>Canis lupus familiaris</i>	Scapula (glenoid fossa portion)	Fragments	None
231A-F-5	Id	65	-	Bovidae (cow)	<i>Bos taurus</i>	Ribs; scapula (pieces mend); Diaphysis section (pieces mend); Diaphysis sections; Metacarpus (proximal portion)	Fragments	Diaphysis sections; Ribs; scapula butchered (cut with metal blade)
231A-F-6	Id	65	-	Suidae (pig)	<i>Sus scrofa</i>	Cranial fragment (supra orbital arch margin); Left mandible fragment (with 3rd molar); Molar; Premolar; Right scapula (proximal portion); Vertebral spinous process; Proximal rib portion; Proximal phalanx;	Fragments	None
231A-F-7	Id	65	-	Suidae (pig)	<i>Sus scrofa</i> (Juvenile)	Left scapula; Humerus (Proximal portion)	Fragments	None
231A-F-8	Id	65	-	Canidae (dog)	<i>Canis lupus familiaris</i>	Proximal rib fragment; Diaphysis sections	Fragments	None
231A-F-9	Id	65	-	Muridae (rat)	<i>Rattus norvegicus</i>	Left femur	Fragment	None
231A-F-10	Id	65	-	Mammalia	<i>Small mammal</i>	Tibiofibula (pieces mend)	Fragments	None
231A-F-11	Ie	81	-	Bovidae (cow)	<i>Bos taurus</i>	Rib; Irregular bones;	Fragments	Butchered (cut with metal blade)
231A-F-12	Ie	81	-	Suidae (pig)	<i>Sus scrofa</i>	Proximal rib; Irregular bones; Diaphysis section	Fragments	None
231A-F-13	Ie	81	-	Aves (chicken)	<i>Gallus gallus</i>	Diaphysis section	Fragment	None
231A-F-14	Ie	81–96	-	Aves (chicken)	<i>Gallus gallus</i>	Tibiotarsal	Fragment	None
231A-F-15	Ie	81–96	-	Mammalia	Medium mammal	Vertebra; Ribs	Fragments	Ribs butchered (with metal blade)



## 4.21 Test Excavation 232 (T-232)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6
<b>TMK #:</b>	2-1-052 [Plat]
<b>Elevation Above Sea Level:</b>	1.43 m
<b>UTM:</b>	618438.0402mE, 2355640.178mN
<b>Max Length/Width/Depth:</b>	6.09 m / 0.8 m / 2.4 mbs
<b>Orientation:</b>	43 / 223° TN
<b>Targeted Project Component:</b>	Utility Relocation
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 232 (T-232) was located within Cooke Street near the Pohukaina Street intersection. T-232 was located on public property owned by the City and County of Honolulu near the southeastern corner of the historic Mother Waldron Park. Utilities included a gas line 2.5 m to the west and sewer line 3.7 m to the southeast of T-232. The excavation surface was level with the surrounding surface.

**Summary of Background Research and Land Use:** The land use for this region consisted of taro cultivation, salt production, and fish farming. Most of the LCAs in the vicinity were small awards with house lots, *lo'i*, and ponds. According to S. E. Bishop's 1884 map of Honolulu, T-232 was located within the *'ili* of Ka'ākaukukui in the LCA 7712:6. LCA 7712:6 was awarded to Victoria Kamāmalu, the sister of Kamehameha IV and Kamehameha V. Baldwin's 1883 map of Honolulu placed T-232 nearly 400 m northeast of the former shoreline. T-232 was within a former marshlands across the Kaka'ako coastal zone, according to S.E. Bishop's 1884 map of Honolulu. W. A. Wall's 1887 map of Honolulu indicated that T-232 was still within an undeveloped area with sparse urban development 165 m to the northeast. M. D. Monsarrat's 1897 map of Honolulu showed a changing landscape, with increased urban development and street grids to the northeast. By 1919 the coastal marshlands were filled and replaced with industrial structures and urban development, according to the U.S. Army War Department map of 1919. Urban development continued through the 1950s with major shoreline extension started in 1933, according to the U.S. Army War Department maps of 1933 and 1943. By 1953, T-232 was within a heavily urbanized area adjacent to Mother Waldron Park, according to the 1953 topographic map by the U.S. Army Mapping Service.

Several archaeological studies had been performed in the vicinity of T-232. Historic burned trash layers (SIHP #50-80-14-07189) and salt pans (SIHP #50-809-14-07190) were identified approximately 250.0 m west of T-232 (Pammer et al. 2011). A post-Contact subsurface deposit (SIHP #50-80-14-01388) was identified approximately 5.0 m west of T-232 (Hammatt 1998). Eleven burials (SIHP #50-80-14-05820) around Mother Waldron Park were identified during archaeological monitoring of a study area located approximately 120.0 m north of T-232A (Douglas 1991, Winieski and Hammatt 2000). T-232 was located within a known subsurface historic burned garbage deposit (SIHP-07189) (Pammer et al. 2011).

**Documentation Limitations:** T-232 was excavated to 2.4 mbs. A gas line present at 0.4 mbs prevented excavation in the northeast end of T-232. Archaeologists were not able to reach the water table or the natural coral shelf due to unstable and collapsing sidewalls.

**Stratigraphic Summary:** The stratigraphy consisted of fill overlying naturally deposited sediments. The observed stratigraphy included asphalt (Ia), gravel base course (Ib), very gravelly silty sand (Ic), crushed coral fill (Id), loamy sand fill (Ie), burned trash fill (II), sandy clay loam, (III), medium grained sand (IV), gravelly sand with clay (V). The stratigraphy observed within T-232 conformed to the USDA soil survey designation of Fill land for the general area. Stratum II was considered to be a component of SIHP #50-80-14-7189, a subsurface deposit from a historic open air burned trash layer.

**Artifacts Discussion:** A total of seven artifacts (Acc. #232-A-1 to A-7) were observed within Stratum II, two ceramic fragments from two vessels, three glass fragments from three bottles, a clay marble, and a polished abalone shell fragment. The bottles were all mold-blown and date between 1860 and the 1920s. Artifacts collected from Stratum II were consistent with a mid to late nineteenth century deposit.

**Features Discussion:** No features were observed.

**Terrestrial Faunal Remains Collected During Excavation:** No faunal remains were collected.

**Sample Results:** No sample analysis was conducted.

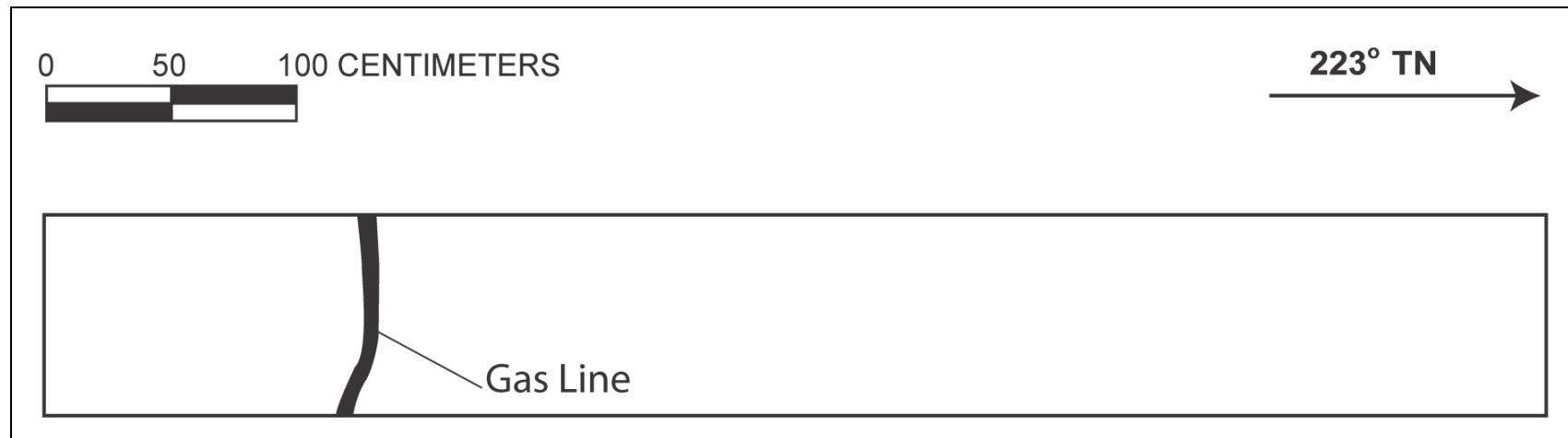
**GPR Discussion:** A review of amplitude slice maps indicated no linear features, although a gas line was encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.25 mbs.

GPR depth profiles for T-232 identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.25 mbs. No utilities were observed in the profile although a gas line was encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-232 was excavated to a depth of 2.4 mbs. Archaeologists were unable to reach the natural coral shelf or water table due to collapsing side walls. The stratigraphy of T-232 was composed of fill layers (Ia–III) overlying naturally deposited sediments (IV–V). The stratigraphy observed within T-232 conformed to the USDA soil survey designation of Fill land for the general area. Artifacts collected from Stratum II were consistent with historic fill deposits. Stratum II was considered to be a component of SIHP #50-80-14-7189, a subsurface deposit from a historic open air burned trash layer (see Volume I for further discussion of all historic properties).

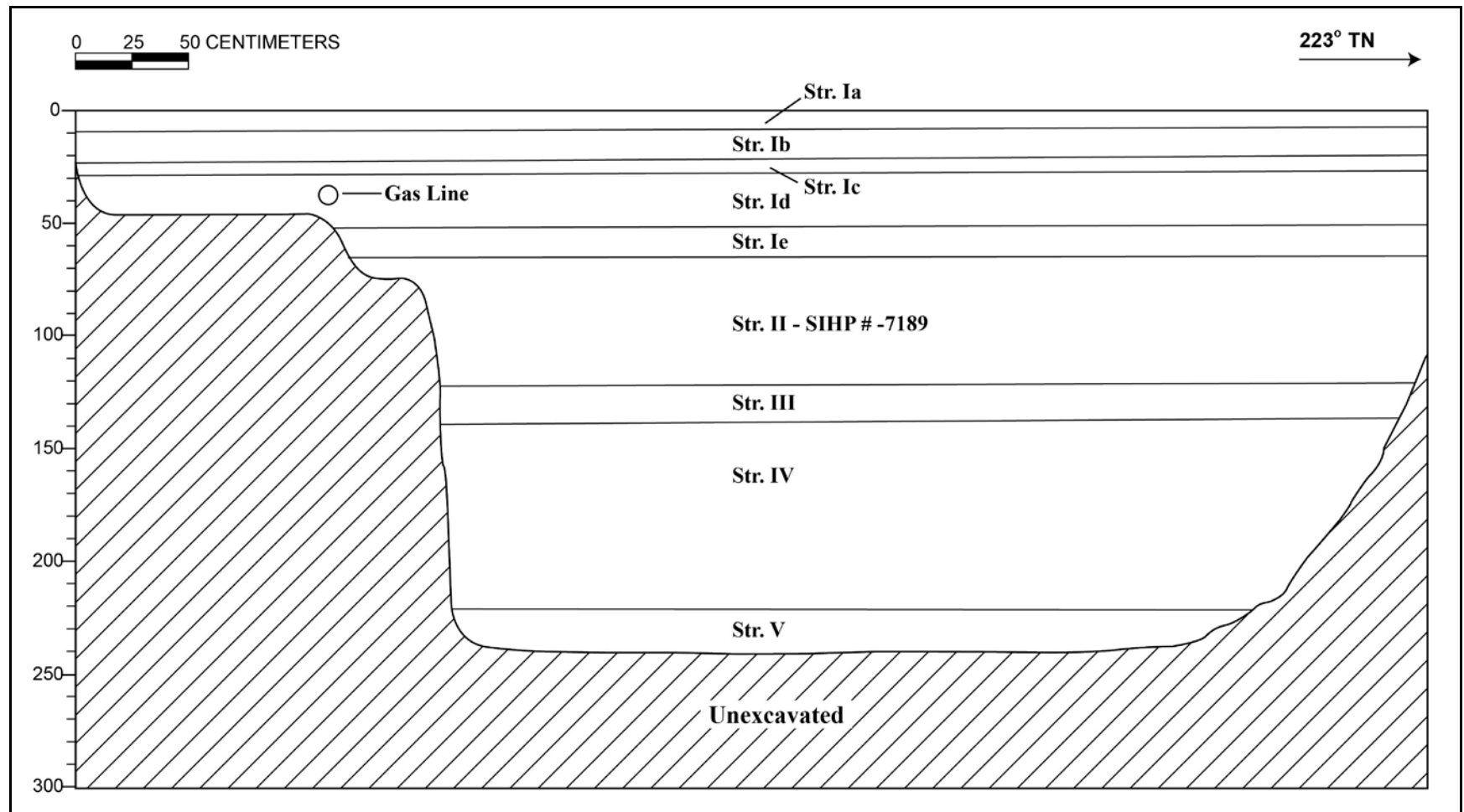


T-232 southeast profile wall, view to south



T-232 plan view





T-232 southeast wall profile

## T-232 Stratigraphy Description

Stratum	Depth (cmbs)	Description
Ia	0–9	Asphalt
Ib	9–22	Fill; 10 YR 5/2 (grayish brown); extremely gravelly silty sand; structureless, single-grain; moist, loose consistency; non-plastic, terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	22–30	Fill; 10YR 5/2 (grayish brown); very gravelly silty sand; single-grain, weak to moderate, fine to medium, blocky/crumb structure; weakly coherent consistency; non-plastic; mixed origins; clear, smooth lower boundary; gravelly silty sand fill boundary between Ib and Id
Id	30–51	Fill; 10 YR 7/4 (very pale brown); extremely gravelly sand; structureless, single-grain; moist, very friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; crushed coral fill
Ie	51–66	Fill; 10 YR 3/2 (very dark grayish brown); loamy sand massive, weak, medium, blocky structure; friable, slightly sticky consistency; non-plastic; mixed origin; clear lower boundary; fine to medium sand
II	66–121	Fill; 10 YR 2/1 (black); sandy clay loam; structureless, single-grain; moist, friable consistency; non-plastic, mixed origin; clear, smooth lower boundary; contains glass bottles, cut bone, fabric, wood, shoe soles; burned trash layer SIHP #50-80-14-7189
III	121–137	Fill; 10 YR 8/2 (very pale brown); silty sand; structureless, massive; moist, friable consistency; slightly plastic; mixed origin; clear, smooth lower boundary; imported hydraulic fill—thin bands (3–4cm) of 10 YR 7/2 hydraulic fill clay
IV	137–200	Natural; 10 YR 6/2 (light brownish gray); medium to coarse sand; single-grain structure; non-sticky consistency; non-plastic; marine origin; clear, smooth lower boundary; natural sand layer
V	220–240	Natural; gley 2 6/1 (bluish gray); fine to medium gravelly sand with clay, single-grain structure; friable, non-sticky consistency; non-plastic; marine origin; lower boundary not visible

T-232 Artifact Analysis Table.

Acc. #232- A-	Provenience	Ceramic Vessel Type	Portion	No.	Paste; Decor.	Origin; Age	Comments
1	T-232, St. II, trash layer	Dinnerware	Body	1	Porcelain; Painted overglaze; gilded	Asian	Green stem, red base; chrysanthemum/gilded; possibly Four Flowers motif
2	T-232, St. II, trash layer	Hollowware, bowl	Base to rim	1	Porcelain	Asian	Blue Asian character on base
Acc. #232- A-	Provenience	Glass Bottle Type	Portion	No.	Color	Origin; Age	Comments
3	T-232, trash layer. St. II	Bottle, beer	Base to shoulder	1	Brown	1870s- post	
4	T-232, trash layer. St. II	Bottle, spirits	Neck to lip	1	Olive	1890s— 1920s	
5	T-232, trash layer. St. II	Vial, medicine	Base to neck	1	Aqua	1860— 1920s	Dimple
Acc. #232- A-	Provenience	Miscellaneous Type	Portion	No.	Material	Origin; Age	Description
6	T-232, St. II	Marble	Complete	1	Clay		Tan color, polished
7	T-232, St. II	Shell, abalone	Fragment	1	Shell		Cut into thick strip and polished on 3 sides



T-232 ceramic fragments (Acc. 232-A-1 and A-2), from Stratum II



T-232 glass bottle fragments (Acc. 232-A-3 and A-5), from Stratum II



## 4.22 Test Excavation 232A (T-232A)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	7712:6
<b>TMK #:</b>	2-1-052 [Plat]
<b>Elevation Above Sea Level:</b>	1.36 m
<b>UTM:</b>	618410.9275mE, 2355610.548mN
<b>Max Length/Width/Depth:</b>	6.6 m / 1.03 m / 1.32 mbs
<b>Orientation:</b>	60 / 240° TN
<b>Targeted Project Component:</b>	Utility Relocation
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 232A (T-232A) was located within Cooke Street near the Pohukaina Street intersection. T-232A was located on public property owned by the City and County of Honolulu near the southeastern corner of the historic Mother Waldron Park. Utilities included a sewer line 2.2 m to the northwest. T-232A was shifted 1.25 m to the northeast and 0.45 m to the northwest in order to avoid an active gas line. T-232A was added to further investigate subsurface cultural deposits, a component of SIHP # 50-80-14-7189 and sand deposits observed in T-232. This test excavation also investigated a utility relocation. The excavation surface was level with the surrounding surface.

**Summary of Background Research and Land Use:** The land use for this region consisted of taro cultivation, salt production, and fish farming. Most of the LCAs in the vicinity were small awards with house lots, *lo'i*, and ponds. As shown on S. E. Bishop's 1884 map of Honolulu, T-232A was located within the *'ili* of Ka'ākaukui in the LCA 7712:6. LCA 7712:6 was awarded to Victoria Kamāmalu, the sister of Kamehameha IV and Kamehameha V. Baldwin's 1883 map of Honolulu placed T-232A 350 m northeast of the former shoreline. T-232A was within a former marshlands across the Kaka'ako coastal zone, according to S.E. Bishop's 1884 map of Honolulu. W. A. Wall's 1887 map of Honolulu indicated that T-232A was still within an undeveloped area with sparse urban development 165 m to the northeast. M. D. Monsarrat's 1897 map of Honolulu showed a changing landscape, with increased urban development and street grids to the northeast. By 1919 the coastal marshlands were filled and replaced with industrial structures and urban development, according to the U.S. Army War Department map of 1919. Urban development continued through the 1950s with major shoreline extension started in 1933, according to the U.S. Army War Department maps of 1933 and 1943. By 1953, T-232A was within a heavily urbanized area adjacent to Mother Waldron Park, according to the 1953 topographic map by the U.S. Army Mapping Service.

Several archaeological studies had been performed in the vicinity of T-232A. Historic burned trash layers (SIHP #50-80-14-7189) and salt pans (SIHP #50-80-14-7190) were identified approximately 250.0 m west of T-232A (Pammer et al. 2011). A post-Contact subsurface deposit (SIHP #50-80-14-1388) was identified approximately 5.0 m west of T-232A (Hammatt 1998). Eleven burials (SIHP #50-80-14-5820) around Mother Waldron Park were identified during archaeological monitoring of a study area located approximately 120.0 m north of T-232A

(Douglas 1991, Winieski and Hammatt 2000). T-232A was located within a known subsurface historic burned garbage deposit (SIHP #50-80-14-7189) (Pammer et al. 2011).

**Documentation Limitations:** T-232A was excavated to the coral shelf at a depth of 1.32 mbs. A gas line was observed at 0.4 mbs and extended along the entire length of the southeast wall. T-232A was widened by 0.3 m on the northwest wall to continue the excavation.

**Stratigraphic Summary:** The stratigraphy consisted of fill layers overlying the natural coral shelf. Observed stratigraphy included asphalt (Ia), gravel base course (Ib), crushed coral fill (Ic), silty sand fill (Id), gravelly clay loam (Ie), sandy clay (If). The stratigraphy observed within T-232A conformed to the USDA soil survey designation of Fill land. Stratum (Ie) was considered to be a component of SIHP #50-80-14-7189, a subsurface deposit from a historic open air burned trash layer.

**Artifacts Discussion:** A total of 16 artifacts (Acc. #232A-A-1 to A-16, see following table and photographs) were collected from strata Id-Ie. Stratum Id artifacts were comprised of seven glass bottle/bottle fragments, all mold-blown before the 1920s. Two bottles could be dated to the time frame of 1874–1913. Stratum Ie ceramic artifacts included a flatware fragment made by an English company in 1853–1871, a teapot, and an English-made stoneware ink bottle made after 1891. Miscellaneous artifacts included a toothpaste jar lid for “Cherry Tooth Paste” made by an English company between 1880–1900. The artifacts collected from strata Id and Ie date to the late nineteenth century.

**Feature Discussion:** No features were observed.

**Terrestrial Faunal Remains Collected During Excavation:** Faunal remains collected from Stratum Ib (0.2–0.3 mbs), Stratum Id (0.65 mbs), and Stratum Ie (0.81–0.96 mbs). Stratum Ib contained bovine, *Canis lupus familiaris*, and unidentified fragments. Stratum Id contained bovine, *Canis lupus familiaris*, *Gallus gallus*, *Rattus norvegicus*, *Sus scrofa*, and unidentified fragments. Stratum Ie contained bovine, *Gallus gallus*, *Sus scrofa*, and unidentified fragments. The faunal remains collected from strata Ib, Id, and Ie were considered food remains from modern to historic fill deposits (see Faunal Analysis Table).

**Sample Results:** A total of three bulk sediment samples were collected from within T-232A including two samples from Stratum Ie between 0.65–0.94 mbs (8 L) and 0.81–0.96 mbs (8 L), and one sample from Stratum If at 0.94–1.1 mbs (2 L). All of the bulk sediment samples were wet-screened.

The bulk sample from Stratum Ie between 0.65–0.94 mbs contained charcoal (15.3 g), Neritidae *Neritita picea* (1.4 g), Patellidae *Cellana exarata* (2.0 g), naturally-occurring, water-rounded marine shell (2.0 g), wood fragments (7.6 g), a large unidentified seed (0.3 g), bottle glass (30.6 g), rusted metal fragments (37.4 g), ceramic fragments (13.2 g), a heavily-corroded possible metal coin or washer (2.6 g), a white porcelain fragment (1.9 g), possible coal or slag pieces (0.8 g), and an unidentified fish bone (1.8 g).

The bulk sample collected from Stratum Ie between 0.81–0.96 mbs contained charcoal (50.3 g), terrestrial snail shells (0.1 g), wood fragments (16.2 g), a seed pod or coating (0.1 g), a possible marine shell fish hook pre-form (0.1 g), a basalt flake (0.3 g), a pig (*Sus scrofa*) bones (0.2 g), a chicken (*Gallus gallus*) bone (0.1 g), a rat (*Rattus* sp.) bone (0.1 g), unidentified fish bones (0.3 g), historic artifacts, and possible marine shell midden. The historic artifacts within the sample

included bottle glass fragments (32.8 g), a rusted metal fragment (11.5 g), metal fragments (33.5 g), metal stakes (20.4 g), a white and green ceramic fragment (4.9 g), possible coal or slag pieces (6.0 g), an earthenware fragment (3.4 g), a ceramic fragment with print (1.5 g), and an iron ball (0.1 g). The possible marine shell midden within the sample included Crustacean (2.6 g), Neritidae *Nerita picea* (1.4), Isognomidae *Isognomon* sp. (0.4), Tellinidae *Tellina* sp. (0.4 g), Patellidae *Cellana exarata* (1.9 g), Bivalve (1.5 g), Ostreidae (0.7 g), Turbinidae *Turbo* sp., and Opercula (0.3 g).

The bulk sample collected from Stratum If contained charcoal (0.5 g), naturally-occurring, water-rounded marine shell (0.7 g), and rusted metal fragments (0.1 g).

Bulk samples analysis identified an abundance of artifacts and cultural material within Stratum Ie and a small amount of historic material within Stratum If. The sample analysis supports the identification of Stratum Ie as a culturally-enriched deposit.

**GPR Discussion:** A review of amplitude slice maps indicated a linear feature on the southwest side of the excavation but no utility was revealed in this area. Reflectivity is relatively uniform throughout the grid and decreases with depth except for the linear feature. A transition from higher reflectivity to lower reflectivity is observed at approximately 0.25 mbs.

GPR depth profiles for Excavation 232A identify horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.2 mbs. An anomaly is observed in the profile but was not encountered and does not correspond to the utilities that were encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-232A was excavated to the coral shelf at a depth of 1.32 mbs. The stratigraphy consisted of fill events (Ia–If). The stratigraphy observed within T-232A conformed to the USDA soil survey designation of Fill land. Artifacts collected from Strata Id and Ie are consistent with historic fill deposits. The faunal remains collected from Strata Ib, Id, and Ie were considered food remains from modern to historic fill deposits. Results of analysis indicated abundant historic artifacts, shell midden, faunal remains, and charcoal. Stratum (Ie) was considered to be a component of SIHP #50-80-14-7189, a subsurface deposit from a historic open air burned trash layer (see Volume I for further discussion of all historic properties). No natural sediments were observed.



T-232A general location, view to southwest

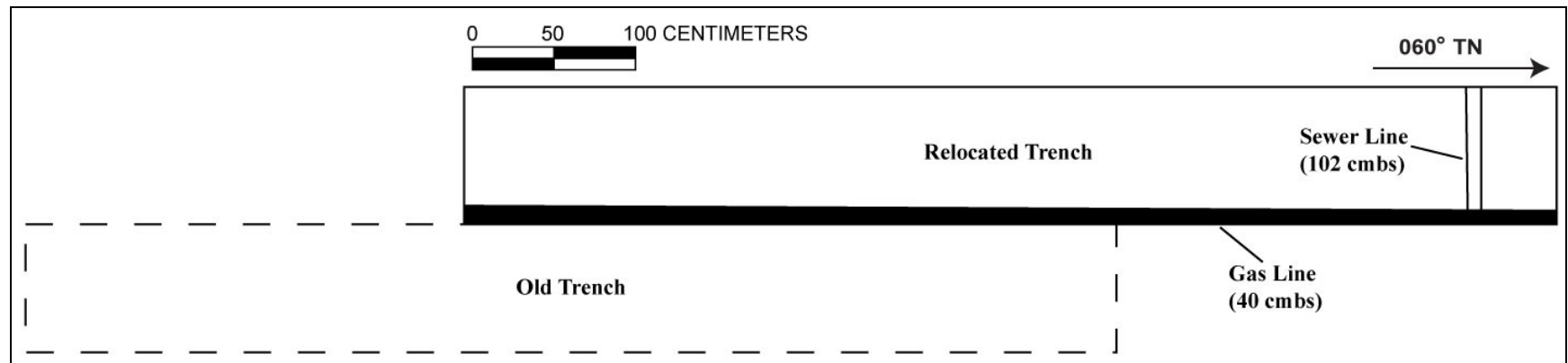


T-232A southeast profile wall, view to east

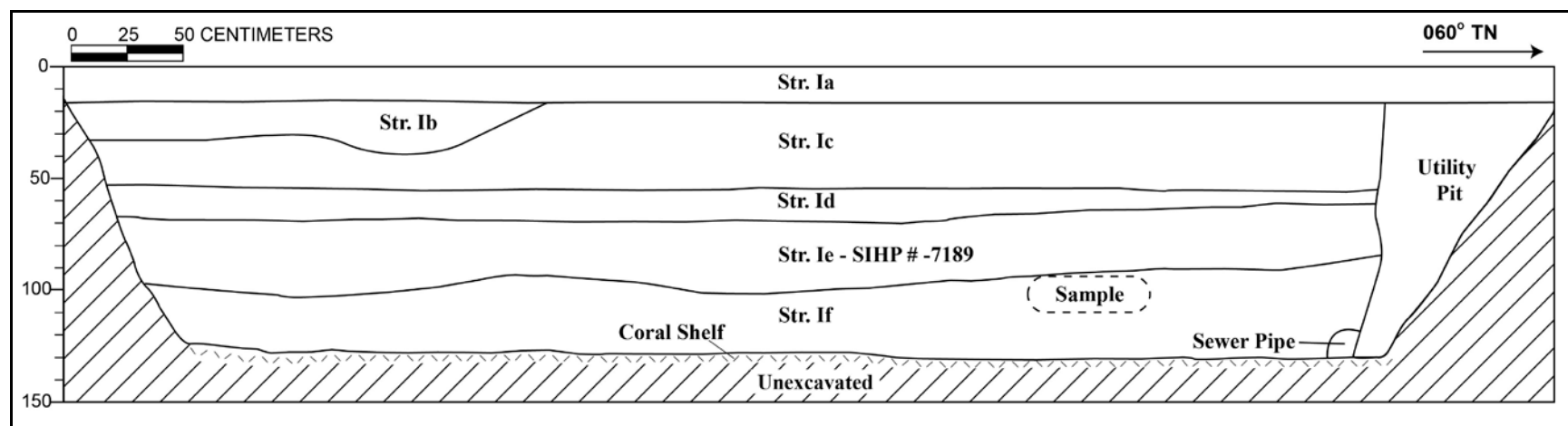




T-232A northwest profile wall, view to north



T-232A plan view



T-232A northwest wall profile

## T-232A Stratigraphic Description for Southeast Profile

Stratum	Depth (cmbs)	Description
Ia	0–15	Asphalt
Ib	15–38	Fill; 10 YR 5/1 (gray); extremely gravelly loam; structureless, single-grain; moist, very friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary gravel base course;
Ic	15–55	Fill; 10 YR 7/4 (very pale brown); very gravelly sand; structureless, single-grain; moist, very friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; crushed coral fill
Id	55–68	Fill; 10 YR 7/4 (very pale brown); silty sand; structureless, single-grain; loose consistency; non-plastic; mixed origin abrupt lower boundary; fill deposit.

## T-232A Stratigraphic Description for Northwest Profile

Stratum	Depth (cmbs)	Description
Ia	0–15	Asphalt
Ib	15–38	Fill; 10 YR 5/1 (gray); extremely gravelly loam; structureless, single-grain; moist, very friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary gravel base course
Ic	15–55	Fill; 10 YR 7/4 (very pale brown); very gravelly sand; structureless, single-grain; moist, very friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; crushed coral fill
Id	55–68	Fill; 10 YR 7/4 (very pale brown); silty sand; structureless, single-grain; loose consistency; non-plastic; mixed origin abrupt lower boundary; fill deposit
Ie	65–102	Fill; 10 YR 3/1 (very dark gray); gravelly clay loam; moist, friable consistency; slightly plastic; mixed origin; abrupt lower boundary; contained historic artifacts; burned trash layer SIHP #50-80-14-7189
If	81–132	Fill; 10 YR 6/3 (pale brown); sandy clay; structureless, single-grain; moist, firm consistency; plastic; mixed origin; abrupt lower boundary; fill deposit
II	132	Coral Shelf



T-232A Artifact Analysis Table.

Acc. #232A -A-	Provenience	Ceramic Vessel Type	Portion	No.	Paste; Decor.	Age; Origin	Comments
1	T-232A, St. Ie	Bottle, ink	Base to shoulder	1	Stoneware	English, 1891–1956	Doulton, Lambeth, England
2	T-232A, St. Ie	Tea pot	Base to rim	1	Porcelain		“t” etched on base
3	T-232A, St. Ie	Flatware	Body	1	Earthenware, Refined (Ironstone)	English; 1853–1871	Elsmore and Forster, England
Acc. #232A -A-	Provenience	Glass Bottle Type	Portion	No.	Color	Age; Origin	Comments
4	T-232A, St. Id	Bottle, medicine	Complete	1	Clear	1870s-post	“T” embossed on base
5	T-232A, St. Id	Bottle, ink?	Complete	1	Clear	1870s-post	
6–7	T-232A, St. Id	Bottle, beer/mineral water	Complete	2	Green	English; 1874–1913	W.E. Johnson Co., Liverpool bottler; Nuttal and Co., Liverpool glass maker
8–9	T-232A, St. Id	Bottle, spirits	Complete	2	Black	1820–1890	Dimple
10	T-232A, St. Id	Bottle	Stopper	1	Clear	1870s-post	
11	T-232A, St. Id	Bottle, bourbon	Body	1	Brown	1860s-post	1 piece reads .... “ERS....URBON....ILLE...KY”
Acc. #232A -A-	Provenience	Miscellaneous Type	Portion	No.	Material	Age; Origin	Comments
12	T-232A, St. Ie	Button	Fragment	1	Marine shell		Iridescent marine shell button fragment with center hole
13	T-232A, St. Ie	Straps, harness?	Fragment (4)	1	Leather		
14	T-232A, St. Ie	Lamp fragment?	Fragment	1	Glass		
15	T-232A, St. Ie	Pavement, block?	Fragment	1	Stone		
16	T-232A, St. Ie	Lid	Complete	1	Ceramic	English; c. 1880–1900	Cherry Toothpaste lid, made by John Gosnell and Co., London



T-232A stoneware ink bottle (Acc. #232A-A-1), from Stratum Ie



T T-232A ceramic teapot (Acc. #232A-A-2), from Stratum Ie



T-232A ceramic artifacts (Acc. #232A-A-16 and A-3), from Stratum Ie



T T-232A ceramic artifacts (Acc. #232A-A-16 and A-3) reverse, from Stratum Ie





T-232A glass bottles (Acc. #232A-A-4 to A-9), from Stratum Id



T-232A bottle stopper (Acc. #232A-A-10), from Stratum Id



## T-232A Faunal Description

Acc. #	Stratum	Depth (cmbs)	Feature	Family/Class	Species	Element	Description	Modification
232A-F-1	Ib	20	-	Bovidae (cow)	<i>Bos taurus</i>	Left humerus distal portion; Diaphysis section	Fragments	Butchered (cut with metal blade)
232A-F-2	Ib	20	-	Canidae (dog)	<i>Canis lupus familiaris</i>	Scapula (glenoid fossa portion)	Fragment	None
232A-F-3	Id	65	-	Bovidae (cow)	<i>Bos Taurus</i>	Rib fragments; Scapula fragment (two pieces mend); Diaphysis section (two pieces mend); Diaphysis sections; Metacarpus (proximal) fragment	Fragments	Rib, Scapula and Diaphysis sections Butchered (cut with metal blade)
232A-F-4	Id	65	-	Canidae (dog)	<i>Canis lupus familiaris</i>	Proximal rib fragment; Diaphysis sections	Fragments	None
232A-F-5	Id	65	-	Aves (chicken)	<i>Gallus gallus</i>	Tibiotarsal fragment; Left scapula; Right humerus	Fragment/Complete	None
232A-F-6	Id	65	-	Muridae (rat)	<i>Rattus norvegicus</i>	Left femur fragment	Fragment	None
232A-F-7	Id	65	-	Suidae (pig)	<i>Sus scrofa</i> (Juvenile)	Left scapula fragment; Humerus (Proximal portion) fragment	Fragments	None
232A-F-8	Id	65	-	Suidae (pig)	<i>Sus scrofa</i>	Proximal rib fragments; Left mandible fragment (with 3 <sup>rd</sup> molar); Molar fragment; Premolar; Right scapula fragment (proximal portion); Cranial fragment	Fragments/Complete	None

Acc. #	Stratum	Depth (cmbs)	Feature	Family/Class	Species	Element	Description	Modification
						(supra orbital arch margin); Proximal phalanx; Vertebral spinous process fragments		
232A-F-9	Id	65	-	Mammalia	Small mammal	Tibiofibula (four pieces mend)	Fragments	None
232A-F-10	Ie	81	-	Bovidae (cow)	<i>Bos taurus</i>	Rib fragment; Irregular fragments	Fragments	Butchered (cut with metal blade)
232A-F-11	Ie	81	-	Aves (chicken)	<i>Gallus gallus</i>	Diaphysis section fragment	Fragment	None
232A-F-12	Ie	81	-	Suidae (pig)	<i>Sus scrofa</i>	Proximal rib fragment; Irregular fragments/ diaphysis section	Fragments	None
232A-F-13	Ie	81–96	-	Aves (chicken)	<i>Gallus gallus</i>	Tibiotarsal (shaft)	Fragment	None
232A-F-14	Ie	81–96	-	Mammalia	Medium mammal	Vertebra fragments; Rib fragments	Fragments	Ribs butchered (cut with metal blade)

## T-232A Sample Results

Exc. #	SIHP #	Stratum	Depth (cmbs)	Category	Weight (g)	Description
T-232A	-7189	Ie	81	Charcoal	15.3	Small to large
				Midden	2.4	Neritidae <i>Nerita picea</i> (1.4 g), Patellidae <i>Cellana exarata</i> (2.0 g)
				Shell (non-midden)	1.3	Gastropods
				Shell (non-midden)	0.7	Crustacean
				Organics	5.5	Wood
				Organics	2.1	Wood
				Organics	0.3	Seed (large)
				Artifact	30.6	Bottle glass
				Artifact	37.4	Rusted metal fragments
				Artifact	13.2	Ceramics
				Artifact	2.6	Possible metal coin or washer (corroded)
				Artifact	1.9	Porcelain (white)
				Artifact	0.8	Possible coal or slag
				Faunal	1.8	Fish
T-232A	-7189	Ie	81-96	Charcoal	50.3	Small to large pieces
				Midden	15.1	Crustacean (2.6 g), Neritidae <i>Nerita picea</i> (1.4), Isognomidae <i>Isognomon</i> sp. (0.4), Tellinidae <i>Tellina</i> sp. (0.4 g), Patellidae <i>Cellana exarata</i> (1.9 g), Bivalve (1.5 g), Ostreidae (0.7 g), Turbinidae <i>Turbo</i> sp. Opercula (0.3 g), terrestrial snails (0.1 g)
				Shell (non-midden)	0.1	Land snails
				Organics	2.2	Wood, small pieces
				Organics	0.1	Seed coating
				Traditional artifacts	0.1	Marine shell, possible fish hook pre-form
				Traditional artifacts	0.3	Basalt flake
				Artifact	32.8	Bottle glass fragments
				Artifact	14.0	Unknown wood flat material
				Artifact	11.5	Rusted metal fragment
				Artifact	33.5	Metal

Exc. #	SIHP #	Stratum	Depth (cmbs)	Category	Weight (g)	Description
				Artifact	20.4	Metal stakes
				Artifact	4.9	Pottery fragment (white and green)
				Artifact	4.0	Possible coal or slag
				Artifact	3.4	Earthenware fragment
				Artifact	1.5	Ceramics with print
				Artifact	0.1	Iron ball
					2.0	Coal or slag
				Water-rounded gravel/cobble	2.9	Rock/cement(?)
				Faunal	0.2	<i>Sus scrofa</i> (pig): proximal rib fragment, irregular fragment, long bone fragment
				Faunal	0.2	<i>Fish</i>
				Faunal	0.1	Fish: spines (miscellaneous)
				Faunal	0.1	<i>Gallus gallus</i> (chicken): tarsometatarsus
				Faunal	0.1	<i>Rattus sp.</i> (rat): Metatarsals
T-232A	-	If	94–110	Charcoal	0.5	Small to medium pieces
				Shell (non-midden)	0.7	Mytilidae <i>Brachidontes crebristriatus</i> , Melampidae
				Historic	0.1	Rusted metal fragments